

**Richland Operations Office**

**FY 2002**

**Performance Evaluation of  
Battelle Memorial Institute  
for the  
Management and Operations of the  
Pacific Northwest National Laboratory**

December 2002



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## I. OVERALL SUMMARY/RATING

The basis for the evaluation of Battelle Memorial Institute's (the Contractor) management and operations of the Pacific Northwest National Laboratory (the Laboratory) during FY 2002 centered on the measures found within the Scientific and Technological Excellence, Management and Operations Excellence, and Leadership Excellence Critical Outcomes. Although Battelle's self-evaluation of the Critical Outcomes and the associated objectives and indicators was the primary means for determining the Contractor's performance, other means such as operational awareness (daily oversight) activities, Department of Energy, Richland Operations Office (RL) reviews, and other outside agency reviews (OIG, GAO, DCAA, etc.) conducted throughout the year were utilized as appropriate to ensure Battelle continued to meet minimum contract requirements throughout the performance evaluation period. In addition, a two-week field review was conducted from October 31 through November 15, 2002, during which time review teams followed up on (verified and/or validated) activities and issues associated with the outcomes and other areas of Battelle's Directorate/Division self-assessments.

The performance evaluation rating for FY 2002 was calculated utilizing the following methodology. The adjectival rating earned for each performance indicator was assigned the appropriate value points. The Objective rating was then computed by multiplying the value points by the weight of each performance indicator within an Objective. These were then added together to develop an overall score for each Objective. The score for each Objective within an Outcome was then computed in the same manner to arrive at a score for each Outcome. The scores for each of the Outcomes were then multiplied by the weight assigned and these were summed to provide an overall score for the Contractor. The total Contractor score was compared to an adjectival rating scale, see Table B below, to determine the overall Contractor adjectival rating for FY 2002. An adjectival rating may be identified at any level of the performance evaluation process (Outcome, Objective, or Indicator); however, the raw score (rounded to the nearest hundredth) from each calculation was carried through to the next stage of the calculation process. The raw score was rounded to the nearest tenth of a point for purposes of identifying the Contractor's overall adjectival rating as indicated in Table B. A standard rounding convention of x.44 and less rounds down to the nearest tenth (here, x.4), while x.45 and greater rounds up to the nearest tenth (here, x.5).

Battelle's performance generally met or exceeded RL expectations throughout FY 2002, however, RL identified fundamental weaknesses in the Contractor's work authorization and funds control processes and identified a number of occurrences of control point violations. These violations reflect poorly on the Contractor's basic internal financial controls. RL has determined that these violations reflect significant financial control weaknesses and that the basic minimum contract requirements related to work authorization and financial controls were not met. As a result, RL has invoked the provisions set forth within the Performance Evaluation and Fee Agreement (paragraph entitled "Adjustment to the Adjectival Rating and Performance-Based Fee Determination") and reduced the Contractor's otherwise earned fee by \$350,000.00. Furthermore the overall performance ratings for both the Management and Operations Excellence and Leadership Excellence Critical Outcomes were reduced from Outstanding to Excellent with 3.0 value points awarded for each. It should be noted here that we recognize the Contractor has taken, and plans to take, several actions to correct many of the issues related to work authorization and funds control. These steps include revising processes and procedures to ensure compliance with DOE Order 412.1, Work Authorization, and other contractual requirements related to funds control. Failure to achieve timely corrective actions may result in further fee reduction determinations and will likely further reduce future overall evaluation ratings. Further details surrounding these issues are identified within Section III, "Other Notables," of this report. Based on this evaluation, the overall performance score was determined to be 3.47 value points, which corresponds to an adjectival rating of **Outstanding**. The overall rating of Outstanding was maintained largely due to Battelle's continued excellence in the overall mission of science and technology. The ratings for each of the Outcomes, as well as the overall rating are indicated within tables A and B below.



Science & Technological Excellence	3.79	Outstanding	60%	2.27	
Management and Operations Excellence	3.0	Outstanding	25%	0.75	
Leadership Excellence	3.0	Outstanding	15%	0.45	
Total Score					3.47

**Table A: FY 2002 Contractor Evaluation Score Calculation**

Total Score	4.0 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 0.5	<0.5
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

**Table B: FY 2002 Contractor Adjectival Rating Scale**

Section III, Other Notables, of this report provides information regarding other RL reviews/evaluations conducted as part of the FY 2002 performance review process. It should be noted that this section is provided for information purposes only and although some strengths and weaknesses were noted, only one identified weakness, identified above, impacted the otherwise earned fee. Even though the other reviews do not affect the evaluation rating or fee, RL expects the Contractor to take special note of the information provided and to take appropriate actions to insure continuous improvement in all aspects of the management and operations of the Laboratory.



## II. CRITICAL OUTCOMES

### 1.0 SCIENTIFIC AND TECHNOLOGICAL EXCELLENCE (60%)

The Scientific and Technological Excellence critical outcome measured the overall effectiveness/performance in delivering science and technology as viewed by the DOE-HQ Office of Science (SC), and other cognizant HQ Offices, performance against three primary science and technology initiatives, and creating and maintaining strategic academic partnerships that strengthen scientific capabilities. The HQ evaluations indicated that Battelle continues to meet and/or exceed expectations regarding the overall scientific and technological programs conducted at the Laboratory. Table 1.2 shows the individual ratings and weighted value points awarded for each of the seven HQ program offices along with the overall value points earned. Each of the initiatives evaluated as part of this outcome (Biomolecular Networks, Computational Sciences, and Nanoscience and Technology) were rated as **Outstanding** and the Contractor continued its excellence in creating and maintaining strategic academic partnerships. Overall the evaluation indicated that Battelle continues to meet and/or exceed expectations regarding the overall scientific and technological programs, affording Battelle an overall rating of **Outstanding** (3.79 value points) for this critical outcome. Table 1.1 and 1.3 shows how the outcome objective ratings were determined as well as the overall outcome rating.

#### 1.1 through 1.4 DOE-HQ Program Office Evaluations

Each of the Program Office evaluations included, as appropriate, the following four objectives: Quality of Science & Technology; Relevance to DOE Mission and National Needs; Success in Constructing and Operating Research Facilities; and Effectiveness and Efficiency of Research Program Management. The following excerpts were taken from the HQ evaluations received. The overall rating from each of the HQ offices was weighted primarily based on business volume. The overall performance rating for this portion of the outcome was determined by multiplying the overall rating (value points) assigned by each of the seven program offices identified below by the weightings identified for each and then summing them (see Table 1.2). When no specific value points were assigned by the HQ reviewing office the appropriate value points were assigned in accordance with the adjectival rating definitions and value points identified in Figure I-1 of the FY 2002 Performance Evaluation and Fee Agreement (J-E-3). For informational purposes the full evaluation reports provided by each HQ office are appended to this report.

#### Office of Science (SC)

The Office of Science (SC) has provided detailed narrative evaluations of performance for each program area to support an overall rating of **Outstanding** with a numerical score of **3.53**. The rating scale is a weighted average by budget amount for the SC program offices of Basic Energy Sciences (BES), Biological and Environmental Research (BER), Advanced Scientific Computational Research, and Fusion Energy Sciences. The FY 2001 rating was also Outstanding, with a numerical score of 4.88 on a five-point scale. Normalizing the FY 2001 score to a four-point scale yields a score of 3.88. The score for 2002 is significantly lower (- 0.37) than for 2001. In 2001 Battelle was rated Outstanding in all goals. In 2002 Battelle was rated Outstanding for Goal 1 (Quality) and Goal 2 (Relevance). The quality and relevance of the Laboratory's research is highly regarded. For example, Contractor researchers supporting the Atmospheric Chemistry component of DOE's Atmospheric Science Program are highly esteemed and consistently draw favorable recognition from the scientific community, professional societies, and collaborators from other federal agencies and universities. Also, research in microbial genomics and proteomics are areas of real strength and expertise at the Laboratory where further development is strongly encouraged. Additionally, other Life Sciences projects are making good progress and have the potential to make substantial contributions to their fields. However, Goal 3 (Facilities) and Goal 4 (Program Management) only received Excellent ratings for FY 2002. Battelle needs to focus on improving performance in Goals 3 & 4 as discussed in the narrative evaluations (see Appendix 1). For example significant concerns were expressed regarding the effectiveness and efficiency of research program management by the BER Life Sciences Program that reports disconnects between BER's broad systems biology goals and the Laboratory's strategic direction and OBER expressed frustration regarding the Contractor's inability to recruit senior scientists in the area of biological sciences.



### **Assistant Secretary for Environmental Management (EM)**

Battelle's overall evaluation in the area of Environmental Management is rated at **Outstanding** (see Appendix 2). Battelle supports many EM related programs, especially in the areas of performance assessment, groundwater vadose zone science & technology, Tank Focus Area (TFA), and support to the Office of River Protection (ORP). The systems assessment capability development made significant progress this last year and will be available to support solid waste decisional documents and ORP needs in the coming year. The results of the last three years of S&T funded research (Environmental Management Science Program and Hanford Site funds) are being successfully integrated into the single shell tank field investigation reports. The results of the research will resolve crucial technical issues concerning transport of tank waste contaminants through the vadose zone and groundwater. The Laboratory's development, in conjunction with the Savannah River Technology Center, of a new formula for vitrifying radioactive waste is expected to result in significant life-cycle savings with a lower operational risk. This new process showed a significantly faster process and technical advancement. Other notable technical accomplishments include the Pit Viper; a Modified Beta Gamma Detector; the Grapple Device and many technical assistance activities. The Contractor did an outstanding job during the transition of the EM-50 programs, especially the TFA work that was successfully transitioned to the Office of River Protection contractors. Agreements and relationships were quickly put into place, and there was a smooth and easy transition of both programs and staff. This allowed for continuity in the technical TFA knowledge base and future potential implementation of those technologies. The Contractor's participation and leadership in the Cleanup Challenges and Constraints Team (C3T) has been extremely relevant to the DOE mission, was of high quality and added tremendous value. The results of the C3T effort as well as the process itself have been seen as significantly impacting the acceleration of the Hanford Cleanup.

Although corrective actions have been taken, areas of concern over the last year have included timely reporting of cost information related to the Hanford Site Solid Waste Program Environmental Impact Statement and Battelle's response to issues related to the Six Phase Soil Heating Intellectual Property rights and licensing which did not facilitate the use of that technology.

### **Office of Defense Nuclear Nonproliferation (NA)**

Battelle's overall performance in the area of Defense Nuclear Nonproliferation is rated at **Outstanding** (see Appendix 3). The Contractor's work with the Office of Nonproliferation Research and Engineering has included successful research, testing of sensors, development of prototypes, and technology transfer. The Contractor continues to support the Office of International Nuclear Safety and Cooperation as managers of the highly successful International Nuclear Safety Program. Battelle has also made significant contributions to the Office of Nonproliferation and International Security, the Office of International Material Protection and Cooperation, and the Office of Fissile Materials Disposition. Battelle has outstanding leadership and management skills. The management team continues to be a great asset and is entrusted to go above and beyond doing well on programs. In an attempt to provide timely support to programmatic needs, Battelle recently made an honest mistake related to the Elimination of Weapons Grade Plutonium Production (EWGPP) program. From a programmatic perspective it is NA's position that the "magnitude of PNNL's outstanding work in reducing the threat to this nation, greatly outweighs the administrative error that occurred in trying to do work as quickly as possible on this important program." The specific work authorization and funds control issues related to EWGPP are discussed in Section III of this report.

### **Office of Intelligence (IN)**

Battelle's overall performance in the area of Intelligence (IN) was rated at **Outstanding** (see Appendix 4). The Contractor has been a real leader in demonstrating that collaborative efforts among the National Laboratory's can lead to exciting new possibilities. The Contractor took the lead in forging consensus for a highly classified IN flagship project. This project will successfully conclude in the near future and will bring great credit to the Department of Energy. In the coming year, IN will use Battelle's leadership as an example of how teaming can work. Also, because of the Contractor's ability to quickly assess a situation and create innovative solutions, they were chosen to assist IN in DOE deliberations about the future of the energy assurance program. The Contractor's professional conduct in the execution of its work and relations with IN sets them apart from many of the other DOE Laboratories.



## Office of Counterintelligence (CN)

The overall performance of the Contractor in the area of counterintelligence is rated at **Outstanding** (see Appendix 5). The CN Inspector-in-Charge conducted a biannual inspection of the Contractor's Counterintelligence program in June 2002. Battelle's program is described as "a mature, integrated program, with high morale, very productive, dedicated, and committed staff, with strong management and all elements in place and functioning effectively." The Contractor has fully integrated key elements of CN's 2002 Strategic Plan into all aspects of its project management.

## Assistant Secretary for Energy Efficiency and Renewable Energy (EERE)

Battelle's overall performance in the area of Energy Efficiency and Renewable Energy is rated at **Outstanding** (see Appendix 6). FY 2002 was a critical transition year for DOE's EERE with several significant changes to strategic budget priorities and organizational structure. As a result, the Contractor made some key strategic changes during FY 2002 to align itself with the new structure and to enhance its alignment with the programs.

The Contractor continues to demonstrate leadership and innovation in managing EERE projects. They provide science and engineering that encourages significant improvements in the technological area. The Contractor emphasizes technology and systems innovations that target improvements in energy infrastructure and security, and the development of low-cost, high performance, solid oxide fuel cells, hybrid fuel cell systems, energy storage systems, bio-based products, and essential technology for a hydrogen economy.

## Assistant Secretary for Fossil Energy (FE)

Overall, the Contractor's performance for the FE Program received a mid-level score between **Excellent** and **Outstanding** (see Appendix 7). The Hydrates project has demonstrated a clear understanding of the program needs and has given the department a clear benefit for the cost incurred. The Solid Oxide Fuel Cells (SOFC) work is timely, good science, and has relevance to the DOE Solid Energy Conversion Alliance (SECA) Program goals. Significant contributions have been made to revolutionize SOFC technology. In the area of distributed generation systems, significant technical progress has been achieved and valuable information in the optimization of fuel cell performance has been attained. In the mixed ionic/electronic conducting Oxide Programmatic area, the project has set an example in exploratory research. In the Sequestration Project, excellent support has been furnished by the Contractor in describing the potential for collection and sale of carbon dioxide (CO<sub>2</sub>) from electric generators for use in CO<sub>2</sub> Enhanced Oil Recovery. The quality of work by Battelle as part of the ion transport membranes (ITM) Syngas/ITM Hydrogen project was excellent. Portions of the project, however, seem to have difficulty staying focused on the program and the needs of the program. The Fossil Energy Program has shown innovativeness and gets results. The Battelle managed Laboratory leads the community in developing modeling and simulation tools to enable more effective progress in the research and development of fuel cell components and power generation systems. The Contractor fuel cell effort is relevant to the DOE mission and is responsive to the DOE SECA program goals. Accelerating and leading the development of fuel cell technology is seen as a means to significantly reduce environmental pollution associated with power generation—thus enabling the U.S. to gain and sustain a strong lead on fuel cell technology and hopefully improving the U.S. foreign trade deficit by increasing exports of power generation systems and also by decreasing fuel imports. The Contractor's involvement and familiarity with varying industrial teams will enhance technology transfer of their research results. The Distributed Generation Systems research directly impacts Department of Energy goals in reducing the nation's dependence on foreign sources of fossil fuels.

## 1.5 Create leading-edge scientific capabilities to support evolving DOE Mission needs

The PNNL Site Office concurs with Battelle's self-assessment rating of **Outstanding** for Critical Outcome 1.5. The Advisory Committees' reviews of the Biomolecular Systems Initiative, Computational Science and Engineering Initiative, and the Nanoscience & Nanotechnology Initiative rated the Initiatives' progress highly and offered useful feedback on improving the Initiatives. The Advisory Committees' reports substantiate that the appropriate rating for Critical Outcome 1.5 is 'Outstanding'. Winning Goal 1 of the Genomes to Life



proposal call in partnership with Oak Ridge National Laboratory is an important step in establishing a significant role in the Department's proteomics research agenda. The Computational Science and Engineering Initiative (CS&EI) is poised to make significant contributions utilizing the Hewlett Packard (HP) supercomputer procured in fiscal year 2002. The importance of meeting the highly visible Office of Management & Budget (OMB) milestones for the HP supercomputer cannot be overstated. The Nanoscience & Nanotechnology Initiative is gaining increasing visibility for its scientific excellence.

In addition to the critical outcome measures for the individual initiatives related to biomolecular networks, computational science and engineering, and nanoscience, it is useful to consider the commentary of the external peer reviewers of the initiatives and discussions with headquarters customers to more fully understand the initiatives progress in the larger context.

#### 1.5.1 Progress against Biomolecular Systems Initiative

The Biomolecular Systems initiative (BSI) expected outcome was rated overall as **Outstanding**. The initiative hired one senior biologist specifically focused on systems biology, two mid-level biologists, and made an offer to one computational biologist by September 2002, fulfilling the criteria of 'outstanding' in the area of recruitment (1.5.1.1). The initiative submitted proposals to DOE and NIH with a focus on proteomics, computational biology and visualization, and microbial research that totaled over \$60M, far exceeding the target value of \$17M required for an 'outstanding' rating (1.5.1.2). The initiative met the criteria for 'outstanding' by demonstrating progress in building a national resource for bioinformatics through the Oregon Health Science University (OHSU) collaboration by submitting two joint NIH proposals and supporting collaborator level relationships at the two institutions. The new multi-disciplinary program in systems biology at the Washington State University (WSU) Tri-Cities was initiated and a tenured position has been identified for the 2003 - 2004 school year in the WSU budget (1.5.1.3). More than fifty papers were submitted for publication in peer-reviewed journals, greatly exceeding the target of twenty or more articles (1.5.1.4). In the peer-review sub-indicator (1.5.1.5), the criteria for an 'outstanding' was met by submission of a comprehensive peer-review committee report that provides feedback on the specific focus areas and scientific-technical content of the initiative, the alignment of the BSI to DOE's missions and programs (GTL in particular), guidance with respect to the Initiative's future activities, and input on collaboration direction and efforts. Attending the peer-review sessions and reviewing the peer-review committee report accomplished validation of the rating by the RL point of contact for the initiative.

Sub-Indicator	Performance	Actual Score	Weighting	Weighted Score
1.5.1.1 Recruiting	Outstanding	4.0	20%	0.8
1.5.1.2 Program Development	Outstanding	4.0	20%	0.8
1.5.1.3 Partnerships and Collaborations	Outstanding	4.0	20%	0.8
1.5.1.4 Continued Technical and Scientific Progress	Outstanding	4.0	20%	0.8
1.5.1.5 Peer Review	Outstanding	4.0	20%	0.8
Total Weighted Score for 1.5.1				4.0

#### 1.5.2 Progress against Computational Sciences and Engineering Initiative

The Computational Sciences and Engineering Initiative expected outcome was rated overall as **Outstanding**. The initiative completed six of the seven technical and scientific progress goals to achieve a rating of 'outstanding' (1.5.2.1). The initiative established an advisory committee of internal and external technical experts to guide the initiative that included the characteristics agreed upon in sub-indicator 1.5.2.2 to meet the performance criteria of 'outstanding'.



Sub-Indicator	Performance	Actual Score	Weighting	Weighted Score
1.5.2.1 Continued Technical and Scientific Progress	Outstanding	4.0	75%	3.0
1.5.2.2 Establish a Computer Science and Engineering Initiative (CS&EI) Advisory Committee	Outstanding	4.0	25%	1.0
Total Weighted Score for 1.5.2				4.0

### 1.5.3 Progress against the Nanoscience and Technology

The Nanoscience and Technology initiative expected outcome was rated overall as **Outstanding**. Each of the four goals (publications, proposals, etc.) for sub-indicators 1.5.3.1 & 1.5.3.2 were met to achieve a performance rating of 'outstanding'. The peer review advisory committee provided feedback on the overall initiative impact, and produced a committee report, which was validated by the RL point of contact, meeting the criteria of 'outstanding' (1.5.3.3).

Sub-Indicator	Performance	Actual Score	Weighting	Weighted Score
1.5.3.1 Increase Visibility of Nanoscience and Nanotechnology Activities at PNNL	Outstanding	4.0	33%	1.32
1.5.3.2 Project and Program Development	Outstanding	4.0	33%	1.32
1.5.3.3 Overall Initiative Impact	Outstanding	4.0	34%	1.36
Total Weighted Score for 1.5.3				4.0

## 1.6 Create and maintain strategic academic partnerships that strengthen scientific capabilities

Battelle has made significant progress in academic partnerships in FY2002. The Contractor has performed at the 'Outstanding' level for the University of Washington collaboration on the Joint Research Institute for Nanoscience and Cell Signaling. Although the measure for the Joint Global Change Research Institute with University of Maryland was rated 'Good' in accordance with the Critical Outcome measures identified within the FY 2002 Performance Evaluation and Fee Agreement, actual performance exceeded expectations in a number of other areas that were judged as excellent. It should also be noted that the Contractor made significant progress in establishing a number of new academic partnerships not reflected in the metrics found within this objective (i.e., the High Temperature Electrochemistry Center with Montana State University; the Northwest Water Research Partnership with the Idaho Water Resources Research Institute, University of Idaho, Oregon State University, the Oregon Center for Water & Environmental Sustainability & Institute for Natural Resources; and the State of Washington Water Research Center; the Northwest Bio-Products Research Institute with Idaho National Engineering and Environmental Laboratory, Washington State University, and the University of Idaho; the Oregon Universities System / Oregon Health & Sciences University Collaborative Working Group; and the Micro-products Breakthrough Institute with Oregon State University). Overall this represents excellent progress in developing academic partnerships.

### 1.6.1 Impact of the Joint Global Change Research Institute with University of Maryland

The Joint Global Change Research Institute with University of Maryland was rated overall as **Good**.



## 1.6.2 Impact of the Joint Research Institute with University of Washington

The Joint Research Institute with University of Washington was rated overall as **Outstanding**.

Sub-Indicator	Performance	Actual Score	Weighting	Weighted Score
1.6.2.1 Impact of the Nanoscience and Nanotechnology Institute with the University of Washington (UW)	Outstanding	4.0	60%	2.4
1.6.2.2 Project and Program Development	Outstanding	4.0	40%	1.6
Total Weighted Score for 1.6.2				4.0

ELEMENT	Adjectival Rating	Value Points	Indicator Weight	Total Points	Objective Weight	Total Points
<b>Objectives 1.1 through 1.4: Program Office Total Scores (from Table 1.2)</b>	Outstanding			3.81	85%	3.24
<b>1.5 Create leading-edge scientific capabilities to support evolving DOE Mission needs.</b>						
1.5.1 Progress against Biomolecular Systems Initiative expected outcomes	Outstanding	4.0	50%	2.0		
1.5.2 Progress against Computational Sciences and Engineering Initiative expected outcomes	Outstanding	4.0	35%	1.4		
1.5.3 Progress against the Nanoscience and Technology expected outcomes	Outstanding	4.0	15%	0.6		
Obj 1.5 Total				4.0	10%	0.4
<b>1.6 Create and maintain strategic academic partnerships that strengthen scientific capabilities</b>						
1.6.1 Impact of the Joint Global Change Research Institute with University of Maryland	Good	2.0	50%	1.0		
1.6.2 Impact of the Joint Research Institute with University of Washington	Outstanding	4.0	50%	2.0		
Obj. 1.6 Total				3.0	5%	0.15
Critical Outcome Total						3.79

**Table 1.1: Science and Technological Excellence Critical Outcome Overall Score Calculation**



HQ Program Office	Adjectival Rating	Value Points	Weight	Weighted Score	Overall Weighted Score
Office of Science	Outstanding	3.53	30%	1.06	
Assistant Secretary for Environmental Management	Outstanding	4.0	25%	1.0	
Office of Defense Nuclear Nonproliferation	Outstanding	4.0	15%	0.6	
Office of Intelligence	Outstanding	4.0	5%	0.20	
Office of Counterintelligence	Outstanding	4.0	5%	0.2	
Assistant Secretary for Energy Efficiency and Renewable Energy	Outstanding	4.0	10%	0.4	
Assistant Secretary for Fossil Energy	Outstanding	3.5	10%	0.35	
Overall Program Office Total					3.81

**Table 1.2: Objectives 1.1 through 1.4 Scientific and Technological Excellence Evaluation Score Calculation for Program Offices**

Total Score	4.0 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 0.5	<0.5
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

**Table 1.3: Scientific and Technological Excellence Critical Outcome Final Rating**



## 2.0 Management and Operations Excellence Critical Outcome (25%)

Battelle's performance within the Management and Operations Excellence Critical Outcome indicates that overall the Contractor has continued to conduct its work in a secure manner that ensures the safety of the worker, public and environment and does so utilizing systems which are increasingly integrated into the day-to-day operations of the Laboratory. Our review also indicated that the Contractor has made outstanding progress in maintaining and enhancing the Laboratory's capability needs. Although the indicators for the business management arena called out within indicator 2.1.2 indicated an overall excellent performance, certain aspects of the Contractor's financial controls were found to be in need of senior management attention during FY 2003. This was based on the issues surrounding the work authorization and funds control processes and identified occurrences of control point violations. This reflects poorly on the Contractor's overall management of the Laboratory. Further details regarding these issues are contained within Section III, Other Notables. Based on the overall results of the objectives and their corresponding indicators discussed below this Outcome was rated as Outstanding, with 3.9 value points earned. However, based on the identified work authorization and funds control issues the overall rating of this outcome is reduced to **Excellent**, with 3.0<sup>1</sup> value points assigned.

### 2.1 Provide management and operational excellence in achieving key contract performance requirements

Throughout FY 2002 the Contractor's performance met or exceeded expectations in most areas reviewed indicating that Battelle continues to provide excellent management and operations ensuring key contract provisions are met. Based on RL's evaluation of the following indicators this objective is awarded an overall rating of **Outstanding**.

#### 2.1.1 Provide ES&H management systems that sustain and enhance Laboratory operations

In the ES&H area, all performance measures were found to be within statistical control and within the agreed upon target values as indicated below, providing for an **Outstanding** rating for this indicator.

Contractor technical and management personnel were involved in the investigation and resolution of two particular off normal events of interest. The first one was an uptake of radioactive material by a staff member in the 306W Building, and the second event was the release of a refrigerator/freezer to Columbia Basin College (CBC) contaminated with low levels of beryllium on the top exterior surface. It should be noted that the Contractor took immediate action to retrieve the refrigerator from CBC, and offered medical screening to CBC personnel. Also Contractor management investigated the radiation material uptake event to determine the cause, and corrective actions are in progress. These corrective actions were determined to be appropriate for the situations.

Performance Measures	Specified Level	FY 2002 Actual Levels
Total Recordable Case Rate	$\leq 2.2$ cases per 200,000 Work hours	1.6 cases per 200,000 work hours
Lost Workday Case Incident Rate	$\leq 1.1$ cases per 200,000 Work hours	0.8cases per 200,000 work hours
Reportable Occurrences of Release to the Environment	$\leq 2$ events	0 events
Percent of Employees with Required Training	$\geq 95\%$	99.7%
Unplanned Dose	0 events	0 events
Spread of Radioactive Contamination	$\leq 3$ events	0 events
Loss of Control of Radioactive Material	$\leq 1$ loss	0
Violations of U.S. DOT Hazardous Materials Shipping Regulations	0 events for major incidents $\leq 1$ events for minor incidents	0 events 0 events



### 2.1.2 Performance against Business Management sub-indicators

This indicator measured three primary business indicators, which form a basis for measuring the ongoing efforts to improve cost efficiency through business growth and optimization of overhead cost. Overall, the Contractor did an excellent job of managing to the sub-indicators which comprise this area earning an overall rating of **"Excellent"** (3.25 value points) for this indicator. Due to circumstances unanticipated at the time the sub-indicator "Total Overhead cost as a multiplier on the Laboratory's total direct costs charged to customers" was developed, this sub-indicator was rated marginal for FY 2002. This sub-indicator has been revisited for FY 2003. Although the Contractor's management of most of the business management functions met or exceeded expectations, fundamental weaknesses were identified in the Contractor's work authorization and funds control processes and subsequent reviews by the Contractor and the DCAA confirmed a total of 25 control point violations occurred between October 1, 2001, and August 2, 2002. These violations reflect significant financial control weaknesses and indicate that basic, minimum contract requirements related to work authorization and financial controls were not met. These issues require immediate management attention by Battelle. The following provides a summary for each of the sub-indicators:

- Cost Management Trends: Overhead cost as a percent of Laboratory's 1830 fully burdened average charge out rate – The Contractor exceeded expectations in lowering overhead costs as a percent of the laboratory's 1830 fully burdened average charge out rate moving past the FY 2001 mark of 53.1% to 52% in FY 2002 earning a rating of **"Outstanding."** DOE is very pleased with the progress achieved to date and encourages Battelle to continue its efforts of meeting the long-term goal of a burdened charge out rate of less than 50%.
- Cost Management Trends: Total Overhead cost as a multiplier on the Laboratory's total direct costs charged to customers – The Contractor was not successful in meeting all of the expectations of this indicator, as is reflected in the assigned rating of **"Marginal."** The intent of this indicator was to measure the total operating cost of the Laboratory divided by the amount of direct costs incurred. The goal was to minimize the multiplier on which overhead is added. The issue with this indicator occurred when the Contractor decided to shift its business mix toward labor-intensive projects. This inadvertently caused a negative impact to the multiplier. The expectation of this indicator was total cost multiplier of 1.6 or less for an outstanding; the Contractor came in at 1.668.
- Resource Management trends: Direct FTE's as a percent of the total Laboratory FTE's – Battelle also exceeded expectations in the balance of direct FTE's as a percent of the total Laboratory FTE's. In FY 2002, Battelle increased the number of staff funded directly while limiting the growth of indirect funded staff resulting in just over 50% of the Laboratory's total FTEs being direct funded, earning a rating of **"Outstanding."**

### 2.1.3 Sustain and enhance the effectiveness of Integrated Safeguards and Security

Battelle has again done an outstanding job in the Safeguards and Security (SAS) arena, completing all agreed upon deliverables on time or ahead of schedule. The creation of the Integrated Safeguards and Security Senior Management Council within the Laboratory has assisted Battelle with the management of the SAS program in a proactive manner. The external reviews have validated Battelle's outstanding performance in SAS and 98.4 percent of line organization staff and management were current with SAS training requirements. The outstanding performance in each of the sub-indicators (see Table 2.3) resulted in an overall **"Outstanding"** rating for this indicator with 4.0 value points awarded.

### 2.1.4 Provide management and operational excellence in achieving adequate investment in maintenance and energy conservation efforts

Performance was outstanding in the areas of facilities operations, maintenance and energy conservation. Performance sub-indicators were all met or exceeded earning an outstanding rating for each (see Table 2.4). The receipt of the International Facility Management Association Golden Circles Award



independently validated this superior performance. DOE Departmental and Federal Energy Management Program awards were also earned for impressive achievements in energy and water conservation.

The Contractor implemented a multi-faceted approach to energy and water conservation resulting in the following accomplishments: exceeded government 2010 goal in 2002 for energy reductions in lab facilities; Sigma V Energy Star® certification; benchmark Stateline Wind farm green power purchase; energy audits of major facilities, water conservation improvements; success obtaining Bonneville Power Administration funding for energy conservation improvements. This performance earned an overall rating of “Outstanding” for this indicator with 4.0 value points awarded.

## 2.2 Maintain and enhance Laboratory capabilities to meet current and future mission needs

This objective was developed to track the Contractor’s progress in meeting the milestones identified within key Contractor plans, which are important in ensuring the current and future needs of the Laboratory are met. Overall DOE agrees with the Contractor’s self-assessments regarding the indicators that make up this objective and provide an overall rating of **Outstanding**.

### 2.2.1 Effective execution of the Information Technology (IT) Infrastructure Strategic Plan to provide the IT infrastructure needed to achieve the 2010 Vision of the Laboratory

Overall, the Contractor has performed very well on this objective this year. The Information Resource Management Staff (IRMS) did an excellent job communicating activities with DOE and met 5 of the 6 Milestones in critical outcome 2.2.1. The sub-indicator entitled “Develop business model and project management plan to upgrade PNNL’s Internet connection to OC-12 to support collaborative simulation and engineering initiatives” was only partially completed. Funding for upgrade of the ESnet link between Seattle and Sunnyvale has not yet been identified, which was part of the sub indicator. Therefore, we concluded that 5 of the 6 sub indicators were met for an adjectival rating of **Outstanding** for this indicator.

The PNNL Site Office has met regularly with the Contractor’s IRMS throughout the course of this fiscal year to review its performance against the performance objectives and indicators related to indicator 2.2.1. These regular meetings and interactions have provided the level of oversight and operational awareness necessary to allow us to indicate our agreement with the Contractor’s self-evaluation for this indicator.

### 2.2.2 Effective execution of the Facilities Strategic Plan to provide the facility space and infrastructure revitalization needed to achieve the 2010 Vision of the Laboratory

Actions taken to plan for and improve the function and condition of facility infrastructure were successfully implemented for many facilities. Five of six measures were successfully completed earning a rating of **Outstanding**. The one measure not met was creation of a project team to implement DOE’s decision on the 300 Area Options Study. This was not met due to DOE’s lack of a decision regarding the 300 Area.

### 2.2.3 Effective execution of the Facilities Strategic Plan to provide the facility space and infrastructure modernization needed to achieve the 2010 Vision of the Laboratory

Many new initiatives were undertaken to construct or plan for new facilities. Eight of nine milestones identified within the indicator were completed for a rating of **Outstanding**. It should be noted that challenging projects to construct space for a new computer at EMSL and new SCIF space in the basement of NSB were completed despite very tight schedules and changing design criteria.



## 2.3 Provide integrated management systems that enable effective and efficient business performance

The DOE agrees with the Contractor's self-evaluation regarding the single indicator that made up this objective and provides an overall rating of **Outstanding**. This objective was designed to measure the Contractor's efforts to increase the efficiency and effectiveness of laboratory management systems.

### 2.3.1 Progress against selected improvement initiatives including Laboratory-level Operations Improvement Initiatives (OII) as well as selected projects sponsored by individual management systems.

The Contractor maintained the Integrated Safety Management System certification through continued improvement in the Voluntary Protection Program (VPP) Star status. In addition, the Contractor was recommended by NSF-International Strategic Registration for the ISO 14001 registration.

Battelle completed a three-year plan for deploying the Integrated Operations System (IOPS) to all the Laboratory's lab-intensive Richland facilities. Implementation of IOPS will assist in establishing and communicating safe laboratory practices, and identification and control of workspace hazards, training, and access.

Battelle also completed the initial development for the Hazard Analysis Initiative. This initiative will integrate the proposal planning risk management decisions of the Electronic Prep & Risk (EPR) process with the IOPS at the bench-level and enhance the capabilities for identifying and mitigating hazards on funded projects.

Three major improvements were made in the area of the Radiological Control Program. First, the Contractor developed and implemented a mapping tool that provides "one stop shopping" for the SBMS requirements and tools associated with radioactive materials. Second, Battelle developed and implemented a web-based Radioactive Material Tracking (RMT) database tool for use within RPL to assure reliable, cost effective, fully compliant tracking of RPL's radioactive materials. The third improvement was the implementation of a risk-based radiological control program for work with low-level radioactive tracers.



ELEMENT	Adjectival Rating	Value Points	Indicator Weight	Total Points	Objective Weight	Total Points
<b>2.0 Management and Operational Excellence</b>						
<b>2.1 Provide management and operational excellence in achieving key contract performance requirements</b>						
2.1.1 Provide ES&H management systems that sustain and enhance Laboratory operations	Outstanding	4.0	25%	1.0		
2.1.2 Performance against business management sub-indicators (roll up from Table 2.2)	Excellent	3.25	25%	0.8		
2.1.3 Sustain and enhance the effectiveness of Integrated Safeguards and Security (roll up from Table 2.3)	Outstanding	4.0	25%	1.0		
2.1.4 Provide management and operational excellence in achieving adequate investment in maintenance and energy conservation efforts (roll up from Table 2.4)	Outstanding	4.0	25%	1.0		
Obj 2.1 Total				3.8	50%	1.9
<b>2.2 Maintain and enhance Laboratory capabilities to meet current and future mission needs</b>						
2.2.1 Effective execution of the Information Technology (IT) Infrastructure Strategic Plan to provide the IT infrastructure needed to achieve the 2010 Vision of the Laboratory	Outstanding	4.0	25%	1.0		
2.2.2 Effective execution of the Facilities Strategic Plan to provide the facility space and infrastructure revitalization needed to achieve the 2010 Vision of the Laboratory	Outstanding	4.0	35%	1.4		
2.2.3 Effective execution of the Facilities Strategic Plan to provide the facility space and infrastructure modernization needed to achieve the 2010 Vision of the Laboratory	Outstanding	4.0	40%	1.6		
Obj. 2.2 Total				4.0	25%	1.0
<b>2.3 Provide integrated management systems that enable effective and efficient business performance</b>						
2.3.1 Progress against selected Operations Improvement Initiative (OII) projects designed to increase the efficiency and effectiveness of laboratory management systems	Outstanding	4.00	100%	4.0		
Obj 2.3 Total				4.0	25%	1.0
Outcome Total						3.0 vs. 3.9 <sup>1</sup>

**Table 2.1: Management and Operations Excellence Critical Outcome Performance Rating Development**



ELEMENT	Adjectival Rating	Value Points	Weight	Weighted Score	Overall Weighted Score
2.1.2 Performance against Business Management sub-indicators					
2.1.2.1 Cost Management Trends: Overhead cost as a percent of Laboratory's 1830 fully burdened average charge out rate	Outstanding	4.0	50%	2.0	
2.1.2.2 Cost Management Trends: Total Overhead cost as a multiplier on the Laboratory's total direct costs charged to customers	Marginal	1.0	25%	0.25	
2.1.2.3 Resource Management Trends: Direct FTE's as a percent of the total Laboratory FTE's	Outstanding	4.0	25%	1.0	
Overall Indicator 2.1.2 Total					3.25

**Table 2.2: Performance Indicator 2.1.2 Overall Score Calculation**

ELEMENT	Adjectival Rating	Value Points	Weight	Weighted Score	Overall Weighted Score
2.1.3 Sustain and enhance the effectiveness of Integrated Safeguards and Security					
2.1.3.1 SAS is integrated into the culture of the organization for effective deployment of the management system	Outstanding	4.0	40%	1.6	
2.1.3.2 Safeguards and Security (SAS) training and knowledge are commensurate with assigned responsibilities	Outstanding	4.0	20%	0.8	
2.1.3.3 External evaluations of performance in SAS programmatic areas reflect satisfactory protection of assets and compliance	Outstanding	4.0	20%	0.8	
2.1.3.4 Emerging threats are identified, reported, and mitigated as necessary	Outstanding	4.0	20%	0.8	
Overall Indicator 2.1.3 Total					4.0

**Table 2.3: Performance Indicator 2.1.3 Overall Score Calculation**



ELEMENT	Adjectival Rating	Value Points	Weight	Weighted Score	Overall Weighted Score
2.1.4 Performance against Facilities and Operations maintenance sub-indicators					
2.1.4.1 Annual actual maintenance cost for PNNL facilities as a percentage of the Replacement Plant Value (RPV)	Outstanding	4.0	40%	1.6	
2.1.4.2 Identification and implementation of energy conservation measures that are commensurate with the Laboratory's strategy to establish a sustainable environment for conducting research and development	Outstanding	4.0	60%	2.4	
Overall Indicator 2.1.4 Total					4.0

**Table 2.4: Performance Indicator 2.1.4 Overall Score Calculation**

Total Score	4.0 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 0.5	<0.5
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

**Table 2.5: Management and Operations Excellence Critical Outcome Final Rating**



### 3.0 Leadership Excellence (15%)

Although the PNNL Site Office concurred with the Contractor's self-evaluation rating of Outstanding (4.0 value points) for this Critical Outcome, based on the identified work authorization and funds control issues discussed within Section III "Other Notables," the overall rating of this outcome is reduced to **Excellent**, with 3.0<sup>1</sup> value points assigned. Battelle's leadership failed on numerous occasions to notify RL when it had reason to believe that a control point would be exceeded as required by the contract. Furthermore, Battelle's leadership had established and implemented an internal policy on anticipatory funding that was contrary to DOE's work authorization policy and terms and conditions of the contract.

Items of note for each of the objectives that make up this outcome are addressed below:

#### 3.1 Attract, develop and retain the critical staff necessary to achieve simultaneous excellence in S&T, operations, and community trust

Battelle has performed very well on this Objective this year, achieving outstanding performance against each of the indicators associated with it. We agree with the Contractor's self-evaluation that their overall performance in this area merits a rating of **Outstanding** and equates to 4.0 value points. However, feedback from various local and HQ programs has indicated a need for management attention during FY 2003, regarding the recruitment and retention of key scientific staff.

The PNNL Site Office and RL-Procurement have met regularly with PNNL-Human Resources staff throughout the course of this fiscal year to review the HR Management System Self Assessment Plan and performance against the Performance Objectives and indicators contained in the plan. These objectives and indicators include monitoring performance against the Critical Outcomes objectives and indicators related to the Human Resources Management System. These regular meetings and interactions, including quarterly status reviews of progress against self-assessment measures and goals, have provided the level of oversight and operational awareness necessary to allow us to indicate our agreement with the Contractor's self-evaluation for Critical Outcome Objective 3.1.

##### 3.1.1 Implement a Laboratory level assessment that establishes a baseline for measuring staff engagement

Battelle successfully completed all four of the criteria established for this indicator; this equates to **Outstanding** performance per the FY 2002 Performance Evaluation and Fee Agreement (PE&FA) and earns 4.0 value points.

Battelle has made significant progress this year in their efforts to increase staff engagement as measured by the Gallup Q12 survey. They have worked to ensure that the majority of managers that received a workplace quality scorecard (95%) attended a Q12 manager orientation (exceeding the goal of 80%). They also performed analyses that indicated that 33% of Battelle's workgroups were rated as "best in class" based upon their scores and that an additional 51% were rated in the middle quartiles. They have taken this information and have held focus groups to help determine what attributes, qualities, and best practices of the managers in the "best in class" work groups could be identified and possibly exported to other work groups. Battelle has taken the information gained from the surveys and analyses and is developing strategies to further improve workforce engagement, and ultimately workforce productivity.

##### 3.1.2 Achieve and maintain competitive base pay levels for all job classifications

Battelle's accomplishment of a year-end Compa Ratio average for all staff classifications of 0.97 equates to **Outstanding** performance per the FY 2002 PE&FA.

Industry standards dictate that effective compensation programs provide employees with market competitive compensation measured by compa-ratios and the appropriate market surveys. The Contractor and the DOE have agreed that compa-ratios for Laboratory employees should be within the range .95 to 1.05% of the appropriate ranges measured by dividing the employees salary by the mid-point



of the appropriate salary range and job family. The average compa-ratio for all job families within the Laboratory falls within the agreed guidelines at .97%.

### 3.1.3 Achieve and maintain a voluntary separation rate (VSR) at or below industry average

The Contractor's voluntary separation rate for FY 2002 was 5.5%, significantly (27%) lower than industry average. This equates to **Outstanding** performance per the agreed to performance indicator and earns 4.0 value points.

Battelle has consistently maintained a voluntary separation rate that is below industry standards. This outcome is based on the fact that the Contractor has done an excellent job of creating a working environment that has interesting, fulfilling work that is conducted in an employee friendly and pleasant surrounding. In addition, Battelle is the premier local employer with the area's best compensation and benefit plans. This combination of work environment, interesting work, and compensation allow Battelle to achieve low separation rate that are below industry standards.

## 3.2 Help define and shape the future of the Region by helping establish a robust, sustainable, regional economy

Battelle has performed very well on this objective this year, achieving outstanding performance against each of the indicators associated with it. We agree with the Contractor's self-evaluation that their overall performance in this area merits a rating of **Outstanding** and equates to 4.0 value points. Battelle's continued outstanding performance in the area of economic development is noteworthy and continues to have a significant impact on the economic development of the local community and region, as well as having a positive impact on community and regional perception of the Laboratory.

The PNNL Site Office has met regularly with the Contractor Economic Development Office staff throughout the course of this fiscal year to review performance against the indicators related to objective 3.2, as well as general Economic Development program activities. Additionally, PNNL Site Office staff visited the six businesses that the Contractor claimed under indicator 3.2.1 as new business starts, relocations, or additional product lines in order to confirm that the businesses were viable per the criteria under indicator 3.2.1 and that the Contractor had a material role in their establishment, expansion, or relocation. These regular meetings and interactions and business visits have provided the level of oversight and operational awareness necessary to allow us to indicate our agreement with the Contractor's self-evaluation for Objective 3.2.

### 3.2.1 The number of new businesses started or expanded in the local area where Battelle had a material role in their establishment

Based upon our evaluation, we concluded that the Contractor had a material role in the establishment of two new business startups, three expansions of existing businesses, and one relocation into the local area, for a total of six new businesses or expansions. Therefore, we conclude that the Contractor successfully achieved an adjectival rating of "**Outstanding**" for this indicator and earned 4.0 value points. The PNNL Site Office visited all six businesses claimed, and confirmed that each business was viable and that the Contractor played a material role in their creation, expansion, or relocation as applicable. In all cases the businesses were extremely satisfied with the support and are looking forward to continue working with the Laboratory.

### 3.2.2 Effectiveness in providing technical assistance to regional firms

Based upon our evaluation, we concluded that the Contractor successfully achieved an adjectival rating of **Outstanding** for this indicator and earned 4.0 value points.

The Contractor claimed to have initiated fifty-two (52) technical assistance's, with ninety-three percent (93%) of the firms responding to a customer satisfaction survey indicating they were satisfied or better with the administration and usefulness of technical assistance. Topics of the Technical assistance



covered a broad range, including environment, energy, industrial processes, medical, materials, computers and software and sensors. As part of the verification of the measure the PNNL Site Office staff interviewed a small sample of the businesses to verify that the technical assistance supplied met the businesses expectations. In all cases, we found that the expectations were met and the companies are expecting to utilize the program again in the future (when applicable). We also reviewed the list of businesses that received technical assistance and found no duplication for FY 2002.

### 3.2.3 Develop and champion at least one new economic development initiative

Part of the vitality of the Contractor's economic development efforts is that new approaches and initiatives for economic development be devised and pursued. This performance indicator was designed to assess the degree to which the Contractor developed and implemented useful and effective new approaches for economic development.

The evaluation looked at four major initiatives that were developed and implemented during FY 2002. Below is a description of those initiatives:

- Battelle, with the support of six partner organizations, led the effort to launch a new Web-based tool, Northwest Technology Investor Network (NWTIN), at <http://www.pnl.gov/edo/technetwork.stm>. NWTIN is an online forum that links investors and entrepreneurs in the high-tech sector. Technology-based businesses and manufacturers from throughout the Northwest can post their business plans on the website, connecting them to a large network of accredited investors. The impact of this initiative is expected in the future as many investors become exposed to business plans of local technology-based entrepreneurs.
- Battelle launched a new Web-based tool, Tech Job Connection (TJC), at <http://www.pnl.gov/edo/jobs.stm>. The tool is a free online source of resumes and job postings for the Mid-Columbia area of Washington and Oregon. It's a way to find qualified employees for technology companies that are within a 50-mile radius of the Tri-Cities and that are not Hanford contractors. The underlying purpose of the TJC is to make experienced, serial entrepreneurs from throughout the Northwest available to local technology-based firms. Since the service began in February 2002, 40 people have listed their resumes and 10 jobs have been posted.
- Near the end of FY 2001, the Contractor hosted a daylong workshop, "Rainmaking in a Capital Drought" to teach entrepreneurs how to seek equity funding. In FY 2002, a videotape of the workshop was made available to local entrepreneurs via streaming video over the Web. The six-hour video was divided into sections and reformatted into a three-part display that shows the presenter and his visual aids simultaneously. To protect the intellectual property of the presenters, the video is available to local entrepreneurs only at a password-protected site. The impact of the workshop will continue in the future now that it is locally available via the Web.
- During FY 2002 the Washington Federal and State Technology (WaFAST) program was initiated. WaFAST provides information, regional conferences, mentoring groups, and direct assistance to firms pursuing SBIR funding. Battelle was a major participant in guiding and executing WaFAST throughout the fiscal year. In particular, The Contractor helped organize and sponsor the first Northwest SBIR conference and also provided speakers and a booth at the event. The impact of WaFAST will be felt mostly in the future as local firms apply the lessons learned in the training provided by the program to more successfully pursue funding.

Based upon our evaluation of the above initiatives, the information supplied by the Contractor and the external input, we concluded that an adjectival rating of **Outstanding** for indicator 3.2.3 was accomplished and 4.0 value points were earned.



### 3.3 Demonstrate the relevance of the National Laboratory and other Northwest research institutions to the economic, science and technology needs of the region

Battelle has performed very well on this Objective this year, achieving outstanding performance against each of the indicators associated with it. We agree with the Contractor's self-evaluation that their overall performance in this area merits a rating of **Outstanding** equating to 4.0 value points. Battelle's continued outstanding performance in the area of economic development, and now increasingly so in helping develop Regional Collaborations intended to help identify regional needs with potential technology related solutions is noteworthy. These efforts are having a positive impact on regional perception of the Laboratory by positioning it as a leader in addressing regional needs via the technologies of regional research institutions.

The PNNL Site Office has met regularly with Contractor staff throughout the course of the year to review Contractor performance against the performance indicators related to objective 3.3. The PNNL Site Office staff has also been active participants on the Laboratory's Regional Involvement Council. These regular meetings and interactions and participation on the Regional Involvement Council have provided the level of oversight and operational awareness necessary to allow us to indicate our agreement with the Contractor's self-evaluation for Objective 3.3.

#### 3.3.1 Establish meaningful partnerships to link regional needs to science and technology strategies

Based upon the DOE evaluation, we concluded that an adjectival rating of "**Outstanding**" for indicator 3.3.1 was accomplished.

This indicator tracked the effectiveness of the Contractor's initiatives to build strong substantive partnerships among the major Northwest (NW) research institutions, state and regional governments entities and the business community of the region. The intention is to identify needs held in common by the states of the Northwest that may, in part, be amenable to S&T solutions available through the major research institutions of the region. In order for the Contractor to be successful, they had to present a draft list of consensus-driven needs of the Region that may lend themselves to S&T solutions.

For this evaluation the PNNL Site Office staff verified the deliverables through regular interactions and reviewed provided documentation. The Contractor has done an excellent job in establishing meaningful partnerships and reconvened the Linking Regional Resources (LRR) group. The LRR group has been very effective in communications, agreeing to a set process for this initiative, and also working to develop a list of regional needs. Progress has been steady and it is expected that the LRR group will make significant progress in FY 2003.

#### 3.3.2 Focus efforts of the regions' research institutions and business communities and units of government on implementing new S&T solutions to a critical few consensus needs of the Northwest

Based upon the DOE evaluation results, we concluded that an adjectival rating of "**Outstanding**" for indicator 3.3.2 was accomplished.

The intent of this indicator was for the Contractor to prepare a process for identifying the necessary resources and implementing S&T solutions. In order for the Contractor to meet the criteria of this indicator, they had to present a process for finding and actually implementing S&T solutions that is endorsed by the Laboratory, other major research institutions, government, and industry representatives.

For this evaluation the PNNL Site Office staff verified the deliverables through regular interactions with Contractor staff and review of provided documentation. The Contractor has done an outstanding job in the development of a process for identifying and implementing S&T solutions. The process was agreed to by all regional entities involved. This process has helped jumpstart the Linking Regional Resource (LRR) group that was formed to lead the efforts of identifying and implementing S&T solutions. The process will help the LRR group with working through some of the identified issues surrounding technology bundling. It is anticipated that the process will be modified as more efficient ways of doing business are identified.



### 3.3.3 Initiate efforts to analyze and leverage the Intellectual property (IP) of the major regional research and development institutions

Based upon the DOE evaluation against the criteria, which was accomplished through regular interactions and review of provided documentation, the Contractor has identified more than two technologies from the region's cooperating research institutions that could be used to address regional needs, therefore an adjectival rating of "**Outstanding**" for this indicator was accomplished.

Battelle has done an outstanding job recognizing the potential of partnering with regional entities (Universities, States, etc.) for the purpose of solving regional needs (i.e. water issues, energy issues) with potential technologies from those identified regional entities. The Contractor has re-initiated the Linking Regional Resources (LRR) group to help them achieve the desired outcome of this measure, which was a difficult task considering the geography of the various research entities. The LRR group is made up of various Universities, and other regional groups within Oregon, Idaho, and Washington. The LRR has been focusing on Energy issues, but has also initiated efforts in the area of remote sensing (image acquisition and processing), the development of bio-based products, and the management of water resources. Through regular meetings, interaction with the community, and the PNNL Site Office's involvement with the Regional involvement council, we were able to verify the progress and completion of this indicator.

Finding these scientific and technological innovations from across the region's research institutions that can be applied to the subset of critical regional needs amenable to S&T solutions can be expected to be a difficult task, but the LRR group has been successful in identifying those regional issues and potential technologies. One reason for the success of the group is the aid of a technology developed at the Laboratory. The information visualization technology permits systematic searching of the inventory of inventions at each institution. This technology has saved the LRR group a vast amount of time and effort.

### 3.4 Continue excellence of the Laboratory's K-20 programs to further and enhance science, mathematics and technology education

The Contractor continues to have a significant impact on science, mathematics, and technology education. RL concurs with the Contractor's self-evaluation rating of **Outstanding** and the assignment of 4.0 value points for this objective and both performance indicators (3.4.1 & 3.4.2).

The Contractor's University Science Education Program (USEP) organization is a credit and asset to the Laboratory, the Tri-Cities Community, Washington state and the nation as they continue to expand their influence. Two FY 2002 surveys, measuring 1) the impact of Laboratory-sponsored programs for K-12 teachers; and 2) the impact of Laboratory-sponsored programs for secondary and post secondary students, form part of a broad set of evidence that serves to illustrate the overall effectiveness of Science & Engineering Education at the Laboratory. For the third straight year, these surveys confirm that the Contractor has enhanced science education by introducing both teachers and students to research at the Laboratory. The programs received an outstanding rating by 88% of the 62 teachers and 92% of the 112 students who participated.

The USEP organization has received consistently high praise from DOE-HQ, RL, educators, students, mentors, and Washington state officials. The Contractor's USEP was instrumental in helping to launch the Washington State Leadership and Assistance for Science Education Reform (LASER) Regional Partnership Project, which has been expanded this year to reach over 166,000 students state-wide. The Contractor increased the minority participation in all Laboratory Fellowships by 23% over FY 2001 and by approximately 36% over FY 2001 for students historically underrepresented in Science, Technology, Engineering and Mathematics (STEM). The Contractor also conducted two new programs for underrepresented students, including a program for high-school aged women and a DOE-FE sponsored program for undergraduate/graduate students from Historically Black Colleges and Universities (HBCUs), Hispanic students, and students in tribal schools. This year also marked a significant improvement in the quality and quantity of student applications for the Contractor's



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Student Research Apprenticeship Program (SRAP), a program that provides underrepresented high school students with summer research appointments to the Laboratory.

In support of the DOE Office of Science, the Contractor promoted national visibility of DOE-SC sponsored programs by conducting a wide spread participation at several recruiting venues as well as direct contact with community college and university faculty. Battelle continues to have a strong focus on programs that enrich the Laboratory's research experience.



ELEMENT	Adjectival Rating	Value Points	Indicator Weight	Total Points	Objective Weight	Total Points
<b>3.0 Leadership Excellence</b>						
<b>3.1 Attract, develop and retain the critical staff necessary to achieve simultaneous excellence in S&amp;T, operations, and community trust</b>						
3.1.1 Implement a Laboratory level assessment that establishes a baseline for measuring staff engagement	Outstanding	4.0	20%	0.8		
3.1.2 Achieve and maintain competitive base pay levels for all job classifications	Outstanding	4.0	40%	1.6		
3.1.3 Achieve and maintain a voluntary separation rate (VSR) at or below industry average	Outstanding	4.0	40%	1.6		
Obj 3.1 Total				4.0	30%	1.2
<b>3.2 Help define and shape the future of the Region by helping to establish a robust, sustainable, regional economy</b>						
3.2.1 The number of new businesses started or expanded in the local area where Battelle had a material role in their establishment	Outstanding	4.0	30%	1.2		
3.2.2 Effectiveness in providing technical assistance to regional firms	Outstanding	4.0	35%	1.4		
3.2.3 Develop and champion at least one new economic development initiative	Outstanding	4.0	35%	1.4		
Obj 3.2 Total				4.0	30%	1.2
<b>3.3 Demonstrate the relevance of the National Laboratory and other Northwest research institutions to the economic, science and technology needs of the region</b>						
3.3.1 Establish meaningful partnerships to link regional needs to science and technology strategies	Outstanding	4.0	35%	1.4		
3.3.2 Focus efforts of the regions' research institutions and business communities and units of government on implementing new S&T solutions to a critical few consensus needs of the Northwest	Outstanding	4.0	35%	1.4		
3.3.3 Initiate efforts to analyze and leverage the Intellectual property (IP) of the major regional research and development institutions	Outstanding	4.0	30%	1.2		
Obj 3.3 Total				4.0	20%	0.8
<b>3.4 Continue excellence of the Laboratory's K-20 programs to further and enhance science, mathematics and technology education</b>						
3.4.1 Impacts of Laboratory-sponsored programs for K-12 teachers of science, mathematics, and technology education in partner school districts	Outstanding	4.0	65%	2.6		
3.4.2 Impacts of Laboratory-sponsored programs for secondary and post-secondary students in the areas of science, mathematics, engineering and technology	Outstanding	4.0	35%	1.4		
Obj 3.4 Total				4.0	20%	0.8
Outcome Total						3.0 vs. 4.0 <sup>1</sup>

Table 3.1: Leadership Excellence Critical Outcome Performance Rating Development



Total Score	4.0 - 3.5	3.4 - 2.5	2.4 - 1.5	1.4 - 0.5	<0.5
Final Rating	Outstanding	Excellent	Good	Marginal	Unsatisfactory

**Table 3.2: Leadership Excellence Critical Outcome Final Rating**

### III. Other Notables

This section of the report provides information regarding other RL reviews/evaluations conducted as part of the FY 2002 performance review process. Our operational awareness and other review activities conducted throughout the year identified the following areas of noteworthy performance and areas for improvement. RL expects the Contractor to take special note of the information provided below and to take appropriate actions to ensure continuous improvement in all aspects of the management and operations of the Laboratory.

#### 1. Areas of Noteworthy Performance

During the evaluation process, RL identified some key examples of noteworthy performance. These examples have been grouped into six categories: Awards/Recognition, Effective Partnering, Responsiveness to Unanticipated Approved Workload, Expectations Exceeded, Facility/Project Performance, and Overall Positive Performance.

##### Awards/Recognition

- Battelle received a conditional recommendation for International Standards Organization (ISO) 14001 registration in late September 2002 from NSF-International Strategic Registration, Ltd. Receipt of ISO 14001 certification will mark the accomplishment of the "Triple Crown" goal (i.e., International Standards Management, Voluntary Protection Program, and ISO 14001) for the Laboratory, and is a significant accomplishment.
- Superior performance was recognized through numerous awards including: International Facility Management Association Golden Circle Award; White House Closing the Circle Award for Pollution Prevention (green janitorial supplies); Federal Energy Management and Departmental awards; and 2nd nomination for the prestigious Governor's Award.
- In March 2002, the Laboratory received a Certificate of Achievement from Secretary Abraham for making the transition to electronic submission of technical reports in the area of Scientific and Technical Information.

##### Effective Partnering

- Overall the partnering between the Contractor organizations and DOE, even during recent changes, has been effective and encouraging. There has been extensive involvement from all parties to help move the Integrated Planning and Assessment Management System forward.
- The Contractor has taken advantage of the new DOE strategy for accelerating clean up of facilities by changing the direction of the Waste Management and Operational Compliance Program and restructuring in a manner that will be more effective. This was an excellent accomplishment and demonstrated the Contractor's ability to team with the PNNL Site Office to gain approval of the baseline change request through the RL change control process.
- The Emergency Preparedness Program has made great efforts to invite and solicit PNNL Site Office participation in daily operations and monthly meetings have been established to facilitate communication.
- Standards Based Management System (SBMS) has maintained an excellent communication with the PNNL Site Office point of contact and met monthly to status progress on the program and the self-assessment.



- The PNNL Site Office has especially appreciated the Contractor's efforts to quickly bring new DOE representatives up to speed in all technical program areas. A distinct improvement has been noted in the partnering between the Energy Science and Technology Division and PNNL Site Office.
- The Battelle Budget Office worked very effectively with the RL financial/budget analyst who filled in during an extended absence of the primary PNNL Site Office financial/budget analyst ensuring the effective continuation of day-to-day operations.

#### Responsiveness to Unanticipated Approved Workload

- The Contractor responded very proactively to post September 11, 2001, heightened national security initiatives and incidents.
- The Contractor provided significant support to the review of current DOE Directives as part of the "Model" Contract initiative and tailoring of requirements to best match the work being done at the Laboratory.
- Congress mandated that DOE provide a plan for implementing external regulation in the areas of Nuclear and Worker Safety. The Contractor staff provided significant support to DOE in response to this mandate.

#### Expectations Exceeded

- The Contractor completed their portion of the Tri-Party Agreement (TPA) milestone M92-16, (i.e., elimination of their Special Case Waste inventory) 4 years ahead of schedule.
- The Contractor not only completed the 32 scheduled building emergency preparedness drills in a timely manner, but also performed a significant number of additional tabletop drills during FY 2002.
- In addition to completing the 5 scheduled assessments, the Contractor Worker Safety & Health program conducted 5 additional assessments in the areas of VPP Annual Review, Beryllium Annual Evaluation (including review of and response to the Hanford Joint Council Report on the Hanford Site Chronic Beryllium Disease Prevention Program), Review of the programs and areas registered with CDC for "select agent" work, RIT's on all applicable requirements, and the 900 NMR Pre-Startup review. In addition, the field matrixed Worker Safety & Health staff assured implementation of the various programs, projects and directorate self-assessments/reviews. Major reviews/assessments under Facilities & Operations (F&O) included: lockout/tagout performance, temporary tag use, operational safety practices related to electrical safety, and implementation of the Beryllium Program.
- The Contractor completed 5 of 6 scheduled Facility Safety assessments and completed 4 additional assessments.

#### Facility/Project Performance

- The Contractor demonstrated innovative management of sub-contractors resulting in on time and under budget demolition of 331B and Dog runs.
- The Contractor demonstrated safe and effective management of RPL building HVAC and switchgear replacement projects.
- The Contractor successfully completed a major effort in support of the installation and commissioning of the 900MHz magnet at the EMSL.

#### Overall Positive Performance

- Significant Line ownership was demonstrated when Radiological Control assisted the National Security Directorate (NSD) in its effort to evaluate recent Radiological Problem Reports (RPRs) in the 329 building for trends and causal factors.



- A review of students and their injury rates was conducted for the past six years. It was determined that over the past three years with management attention and training an 80% reduction in student injuries and a 71% reduction in overall injury rates was achieved.
- The Contractor received the highest percentage of completed Environmental Safety & Health (ES&H) training for its staff in any year. ES&H/Q for the first time received a 100% rating in the required ES&H/Q training.
- Participation by all Research & Development (R&D) organizations/groups has increased this year due to new Standards Based Management System (SBMS) requirements related to development of the subject areas covered by SBMS. This increase the likelihood that procedures developed within SBMS will be relevant to the work to be performed and helps prevents the introduction of unnecessarily restrictive or administrative burdensome procedures with low value added.
- The Contractor demonstrated an effective strategy in gaining DOE approval of the restructuring of the EM Waste Management and Operational Compliance Program and successfully implemented a waste management charge back database to allow a smooth transition from EM-40 funded waste coverage to waste generator fees.
- The Contractor enhanced the quality of mentoring provided by staff to students by creating “toolkits” that better prepare staff and students for their appointments.
- The Contractor continues to receive numerous accolades and hits every month for their informative diversity website. They continue to actively recruit nation-wide, utilizing various targeted recruitment tools and advertisement sources to attract a diverse talent pool for posted openings. Despite these efforts there continued to be less than expected representation of minority and women candidates in the interview pools. RL found that Battelle continues to expend dedicated Human Resources and Management staff to increase the representation of the above groups. While most contractors were downsizing, Battelle was one of only two contractors that increased their representation at the Hanford site this year. Additionally, the Contractor recently received a very favorable compliance review from the Office of Federal Contract Compliance Programs (OFCCP) with no issues identified, which is very rare for an organization the size of the Contractor.
- Battelle’s tracking and reporting of negotiated cost savings is considered a best practice by RL. The emphasis to increase cost savings negotiated on procurement actions should result in significant savings to Government programs.
- Battelle Legal's policies and practices in the area of litigation management have been very effective in terms of both cost and quality. The statistics bear witness to the effectiveness of the program. The newly created "brief bank" will be especially beneficial to the Laboratory and potentially the entire Site. Within the Key and Core Legal Issues section, support for the Human Subjects Research appears to be at a typically high level; and support in revising the Laboratory Human Resources policies to stay current with relevant state employment law has taken a conservative approach likely to avoid substantial future litigation risks.
- The Contractor demonstrated leadership and initiative by developing and publishing a Safeguards and Security Plan (SSP) that effectively removed the Laboratory from the Hanford SSP, providing an autonomous protection strategy that supports the work and mission of the Laboratory and is supportive of Office of Science restructuring.
- The Contractor developed a web-based training platform for those selected as administrative facility Building Emergency Directors (BEDs).



## 2. Areas for Improvement

During the evaluation process, RL identified some key examples of areas in need of improvement. These examples have been grouped into five categories: Work Authorization and Funds Control, Data Quality/Analysis, Sub-Contractor Flowdown, and Management.

### Work Authorization and Funds Control

Fundamental weaknesses were identified in the Contractor's work authorization and funds control processes and subsequent reviews by the Contractor and the DCAA confirmed there were a total of 25 control point violations between October 1, 2001, and August 2, 2002. Battelle had not notified RL when it had reason to believe that a control point would be exceeded as required by the contract. RL has determined that these violations reflect significant financial control weaknesses and that basic, minimum contract requirements related to work authorization and financial controls were not met. The Contractor lacks a disciplined process that ensures DOE financial control points and contractual requirements in this area are adhered to. Several weaknesses including the lack of adequate written operating procedures and definition of key funds control terminology were noted. In some cases, the Contractor's analysis performed was not applied consistently or did not appear well supported and documented. As a result, RL has invoked the provisions set forth within the Performance Evaluation and Fee Agreement (paragraph entitled "Adjustment to the Adjectival Rating and Performance-Based Fee Determination") and reduced the Contractor's otherwise earned fee by \$350,000.00. Furthermore the overall performance ratings for both the Management and Operations Excellence and Leadership Excellence critical outcomes were reduced from Outstanding to Excellent with 3.0 value points awarded for each.

The Elimination of Weapons-Grade Plutonium Production Project (EWGPP) is an example of one project lacking the proper written work authorization and funding. In February 2002, Battelle initiated work on the EWGPP prior to (and in anticipation of) formal authorization and receipt of funding from the Department. Battelle incurred costs and charged DOE accounts by following its own internal policy, entitled "Anticipatory/Overrun Authorizations." The Contractor and its internal anticipatory process did not meet the requirements in DOE Order 412.1, Work Authorization, and several contract clauses. Battelle used government funds to pay EWGPP Program costs by issuing payments against the DOE payments cleared account and inappropriately recording the related costs against a RL "suspense" account. The Contractor terminated work on June 5, 2002 after incurring costs of approximately \$825,000. Battelle was then directed to no longer use its anticipatory process—except for Work for Others in accordance with the contract. On June 25, 2002, the DOE Contracting Officer directed the Contractor to reimburse all EWGPP program costs plus interest, which it promptly did.

The Contractor has taken, or plans to take, several actions to correct the issues related to work authorization and funds control. These steps include revising processes and procedures to ensure compliance with DOE Order 412.1, Work Authorization, and other contractual requirements related to funds control, and realignment of the financial organization to strengthen funds control. Failure to achieve timely corrective actions may result in further fee reduction determinations and will likely reduce future overall appraisal ratings.

### Data Quality/Analysis

- In September, the Contractor performed a self-assessment of the Suspect/Counterfeit Items Program. The assessment identified minor problems with the program, but failed to address the seven events reported in ORPS regarding the suspect/counterfeit items.
- A DOE procurement review of the Contractor's Balanced Scorecard self-assessment report concluded that improvement in data entry into Battelle's procurement system is needed.
- In the area of Financial Management, RL has noticed a decline in the overall quality of Battelle financial products that may indicate a need to reexamine the appropriate level of management review of deliverables. For example:
  - Battelle's DOE financial statement narrative comments did not reflect an accurate knowledge of Battelle accounting systems and how accounts receivable transactions are processed.
  - Some Unicall products did not comply with RL direction and/or were delivered late. RL rework was required to meet deadlines.



- Battelle's mandatory obligations submission (an essential document used by DOE during a Continuing Resolution) did not completely reflect Battelle funding requirements and required rework.
- RL directions were not completely followed when preparing the uncosted obligations submission. Extensive last minute RL rework was required.
- Incorrect data was used to support Battelle's actual/reasonable travel reimbursement proposal.
- Incorrect data was used for justification to reimburse Battelle for costs incurred for EMSL conferences.

#### Sub-Contractor Flowdown

- The Contractor needs to ensure that its sub-contractors are implementing the agreed upon Safety and Health Plan and field overview flow down requirements.
- Increased health and safety training is needed for agreements or contracted work. Many self-assessments indicated that lack of effective communication was of concern. This issue was also identified as part of the annual VPP Review/Evaluation.

#### Management

- In the area of Property Management, the lack of decision-making by the Contractor created an awkward situation for RL and created a difficult situation for the Oak Ridge Operations Office related to the transfer of equipment. This situation was created when the Contractor failed to execute several options available to them to dispose of the Sprang Power Transformer and the off gas system. It was not until RL intervened that a disposal path was determined.
- Battelle Legal's policy of regular interaction with programs in order to prevent legal issues is a good plan, but the EWGPP incident illustrates a need for better execution of the plan. The self-evaluation report does not address the issue. The report could have clarified Battelle Legal's involvement in the decision to utilize DOE funds for the yet-to-be-authorized workscope. Battelle Legal involvement evidently was almost entirely after-the-fact, which underscores the importance of more interaction with programs at an earlier stage. On two occasions (whether to file an appeal in Teen Help lawsuit, and the cost allocation issue in the state tax audit matter), earlier, clearer, communication would have been helpful.

# Appendix I



## Department of Energy

Washington, DC 20585

December 12, 2002

Mr. Paul W. Kruger  
Assistant Manager for Science and Technology  
U.S. Department of Energy  
Richland Operations Office  
825 Jadwin Avenue  
Richland, Washington 99352

Dear Mr. Kruger:

For fiscal year 2002 the Pacific Northwest National Laboratory's (PNNL) overall performance on Office of Science (SC) science and technology programs is rated as Outstanding. This rating relates to a scale that includes Unsatisfactory, Marginal, Good, Excellent, and Outstanding. It is a weighted average of performance evaluations provided by each SC program office, with the budget for PNNL from each office as the weighting factor. This summary rating combines overall performance evaluations by the SC offices of Basic Energy Sciences (BES), Biological and Environmental Research (BER), Advanced Scientific Computational Research, and Fusion Energy Sciences.

Although the overall rating is Outstanding, the scores have declined significantly from last year's rating. In 2001, PNNL was rated as Outstanding in every criteria; this year the laboratory's performance is rated as Outstanding in only two of the four criteria. Among the reasons given for this: the Environmental Molecular Sciences Laboratory is not yet fulfilling its mission as a National Scientific User Facility; in particular, the user program is not as robust as needed. Significant concerns are cited regarding the effectiveness and efficiency of PNNL's research program management. BER's Life Sciences Program reports that there are disconnects between BER's broad systems biology goals and PNNL. Also, PNNL is found to be having difficulty attracting either top quality scientists, collaborations with other national laboratories and universities, or increased BER research funding. Management of low dose radiation research is described as "weak", and issues of record-keeping were noted by the merit review site visit panel. The Terrestrial Carbon Sequestration Research Program reports that there has not been adequate publication of research results, and, PNNL has made insufficient scientific contributions to the goals of the Carbon Sequestration in Terrestrial Ecosystems Program. Finally, BES experienced problems in the reorganization of the Molecular Processes programs.



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Enclosure 1 summarizes the overall SC weighted-average ratings by each goal. Enclosure 2 provides the individual SC program ratings of the laboratory's performance for each of the performance evaluation factors. Also enclosed are full narrative evaluations from each program area.

Sincerely,

A handwritten signature in black ink, appearing to read "Raymond L. Orbach". The signature is fluid and cursive, with the first name "Raymond" being the most prominent.

Raymond L. Orbach  
Director  
Office of Science

Enclosures

**Enclosure 1:**

**OFFICE OF SCIENCE  
PACIFIC NORTHWEST NATIONAL LABORATORY EVALUATION  
FY 2002 SC WEIGHTED AVERAGE RATINGS BY GOAL:**

Overall Consolidated Rating: Outstanding  
Weighted Average Score: 3.53

**Goal: 01 Quality of Science & Technology**

Consolidated Rating: Outstanding  
Weighted Average Score: 3.75

**Goal: 02 Relevance to DOE Missions or National Needs**

Consolidated Rating: Outstanding  
Weighted Average Score: 3.84

**Goal: 03 Success in Constructing and Operating Research Facilities**

Consolidated Rating: Excellent  
Weighted Average Score: 3.25

**Goal: 04 Effectiveness and Efficiency of Research Program Management**

Consolidated Rating: Excellent  
Weighted Average Score: 3.29

## Enclosure 2

**PACIFIC NORTHWEST NATIONAL LABORATORY**  
**FY 2002 RATINGS OF EACH GOAL BY EACH OSC PROGRAM**  
 G = Good; E = Excellent; O = Outstanding

	Goal 1: Quality	Goal 2: Relevance	Goal 3: Facilities	Goal 4: Program Mgt.	Overall Program Rating	Overall OSC Weighted Average
BES	3.60 - O	3.60 - O	N/A	3.60 - O	3.60 - O	
BER	3.80 - O	3.93 - O	3.25 - E	3.13 - E	3.53 - O	
ASCR	3.80 - O	3.85 - O	N/A	3.75 - O	3.80 - O	
Fusion	3.80 - O	3.80 - O	N/A	3.80 - O	3.80 - O	
OVERALL	3.75 - O	3.84 - O	3.25 - E	3.29 - E		3.53 - O

**SCORING RANGES for PACIFIC NORTHWEST NATIONAL LABORATORY:**

Outstanding      3.50 - 4.0  
 Excellent        2.50 - 3.49  
 Good              1.50 - 2.49  
 Marginal         0.50 - 1.49  
 Unsatisfactory   0.0 - 0.49

**NARRATIVE TEXT for the  
FY 2002 APPRAISAL OF PACIFIC NORTHWEST NATIONAL LABORATORY by the  
OFFICE OF SCIENCE**

**OFFICE OF BIOLOGICAL AND ENVIRONMENTAL RESEARCH  
FY 2002 Science and Technology Performance Evaluation for  
Pacific Northwest National Laboratory (PNNL)**

**I. Review by the Climate Change Research Division (SC-74), FY 2002 Appraisal of Pacific Northwest National Laboratory**

**CRITERION 1: QUALITY OF SCIENCE & TECHNOLOGY**

**SC-74's OVERALL WEIGHTED AVERAGE RATING FOR GOAL 1: OUTSTANDING--3.80**

**Individual Scores:**

**KP 1201030**

**SCIENCE:** The ARM science projects at PNNL are excellent.

**Numerical Score:** 3.49

**Adjectival Rating:** Excellent

**KP 1202010 Atmospheric Chemistry Component**

**Adjectival Rating:** Outstanding

**Numerical Score:** 3.75

**SCIENCE:** Basic research conducted by PNNL scientists in support of the Atmospheric Chemistry component of DOE's Atmospheric Science Program is consistently outstanding, drawing favorable attention from the scientific community and recognition from professional societies, and attracting collaborators from other federal agencies and universities.

**KP 1202010 - Environmental Meteorology Component**

**Adjectival Rating:** Outstanding

**Numerical Score:** 3.58

**SCIENCE:** During FY2002, PNNL scientists have made substantial progress in addressing some of the questions related to vertical transport and mixing (VTMX) in the atmosphere in the Salt Lake City basin. The quality of the science by PNNL researchers involved in the VTMX research has been outstanding.

**KP 1202020**

**Numerical Score:** 3.0

**Adjectival Rating:** Excellent

**SCIENCE:** Sustained progress is achieved in carbon sequestration research; need to work on publication of research results and scientific contribution to CSiTE goals.

**KP 1204020**

**SCIENCE:** Jae Edmonds and the team of scientists that is developing the integrated assessment modeling framework and the technology strategy project are world leaders in synthesizing scientific results with respect to climate change, technologies for mitigation, and studies of adaptation and impact. The research that the PNNL team conducts is widely accepted as some of the premier research in the field. Specialized research, such as that conducted by Hugh Pitcher and Norm Rosenberg, is widely respected.

**Numerical Score:** 4.0

**Adjectival Rating:** Outstanding:

**CRITERION 2: RELEVANCE TO DOE MISSION AND NATIONAL NEEDS**

**Review by the SC Climate Change Research Division (SC-74)**

**SC-74's OVERALL WEIGHTED AVERAGE RATING FOR GOAL 2: OUTSTANDING--3.93**

**Individual Ratings:**

**KP 1201030 - ARM Program**

**Numerical Score:** 4.0

**Adjectival Rating:** Outstanding

**SCIENCE:** The ARM program is the largest DOE global change program. The PNNL ARM research and

infrastructure support is highly relevant to the DOE mission and national needs.

KP 1202010 - Atmospheric Chemistry component

Numerical Score: 4.00

Adjectival Rating: Outstanding

SCIENCE: Scientific advances from basic research conducted by PNNL scientists in support of the Atmospheric Chemistry component of DOE's Atmospheric Science Program are highly relevant to the DOE mission and national needs. Indeed, in the arena of atmospheric chemistry, PNNL scientists often lead the way. Results from field campaigns involving the DOE Research Aircraft Facility at PNNL are often cited by other federal agencies.

KP 1202010 - Environmental Meteorology component

Numerical Score: 3.51

Adjectival Rating: Outstanding

The VTMX science at PNNL is highly relevant to the Environmental Meteorology component of the Atmospheric Sciences Program and is performed in a manner that is highly complimentary to the DOE mission and national needs.

KP 1202020 - Terrestrial Carbon Sequestration Research

Numerical Score: 3.0

Adjectival Rating: Excellent

SCIENCE: Results contribute to DOE research mission on carbon sequestration; research product value and visibility could be enhanced through journal publication and interactions with developing National and DOE Programs

KP 1204020 - Integrated Assessment

Numerical Score: 4.0

Adjectival Rating: Outstanding

SCIENCE: The team led by Jae Edmonds has an uncanny ability to anticipate policy needs and conduct highly relevant research in advance of the requirement. This is especially valued in a high visibility environment such as climate change, and it has allowed Dr. Edmonds and others to contribute significantly to high-level policy discussions.

CRITERION 3. SUCCESS IN CONSTRUCTING AND OPERATING RESEARCH FACILITIES

Review by the SC Climate Change Research Division (SC-74)

SC-74's OVERALL WEIGHTED AVERAGE RATING FOR GOAL 3: EXCELLENT--3.25

KP 1201030 - ARM Program

Numerical Score: 3.7

Adjectival Rating: Outstanding,

The engineering and science team support have been exceptional. The development and implementation of the common data system has improved the operation of the sites and the flow of data. The planning and conduct of Intensive Operational Periods has also been outstanding.

KP 1202010 - Atmospheric Chemistry Component of Atmospheric Sciences Program

Numerical Score: 4.00

Adjectival Rating: Outstanding

Operation and management of the DOE Research Aircraft Facility at PNNL is consistently outstanding. The availability of the G-1 aircraft is well known and requests from other agencies for DOE to participate in multi-agency field campaigns are the rule rather than the exception. Scientists from both within and beyond the DOE labs routinely participate in G-1 campaigns, bringing state-of-the-art instrumentation and expertise. This facility is very highly regarded throughout the atmospheric science community.

KP 1202020

Not Applicable

KP 1204020

Not Applicable

Criterion 4: EFFECTIVENESS AND EFFICIENCY OF RESEARCH PROGRAM MANAGEMENT

Review by the SC Climate Change Research Division (SC-74)

SC-74's OVERALL WEIGHTED AVERAGE RATING FOR GOAL 4: EXCELLENT—3.13

KP 1201030 - ARM Program

Numerical Score: 2.4

**Adjectival Rating: Good**

The revision of the ARM science plan is long overdue. The revised plan is necessary to reflect new directions stemming from recent scientific findings and from the planned new mobile ARM facility. Additional effort needs to be given to improve the effectiveness with which technical results are communicated in order to maximize the value of the research results and to gain appropriate recognition for DOE and the Laboratory.

**KP 1202010 - Atmospheric Chemistry component**

Numerical Score: 3.75

**Adjectival Rating: Outstanding**

Research planning and management of research at PNNL in support of the Atmospheric Chemistry component of DOE's Atmospheric Science Program is consistently first-rate. Examples are (1) PNNL's leadership role in environmental meteorology, (2) PNNL's management of the DOE Research Aircraft Facility, (3) PNNL's management and leadership role in community-wide field campaigns, and (4) PNNL's major role in strategic planning for the Atmospheric Science Program.

**KP 1202010 - Environmental Meteorology component**

Numerical Score: 3.88

**Adjectival Rating: Outstanding**

Management of the VTMX science by PNNL has been outstanding. It has helped ensure that a high level of coordination and cooperation among the participating investigators was established and maintained.

**KP 1202020 - Terrestrial Carbon Sequestration Research**

Numerical Score: 3.0

**Adjectival Rating: Excellent**

Carbon sequestration research is managed effectively; more attention is recommended to unique research products, and the publication of results in high visibility journals.

**KP 1204020 - Integrated Assessment**

Numerical Score: 4.0

**Adjectival Rating: Outstanding**

The PNNL team led by Jae Edmonds uses a somewhat different management style than other integrated assessment teams. It relies on a small inner circle of scientists who have worked together for years. In addition, alliances are formed with scientists from other countries, and reliance is placed on the ability of such alliances and the personal contacts of team members to develop those portions of the model that reflect non-US activities. This strategy has worked very well; it has a side benefit of entraining other bright scientists and helping international cooperation at the scientific level.

**II. Review by the Life Sciences Division (SC-72), input for PNNL Fiscal Year 2002 Appraisal,****Criterion 1: Quality of Science and Technology**

Review by the Life Sciences Division

Numerical Rating: 3.6

**Adjectival Rating: Outstanding****Comments:**

PNNL's Life Sciences research portfolio continued to grow in FY 2002 due to the success of its proteomics research and its successful partnership with Oak Ridge National Laboratory in receiving funds from the Genomes to Life program. Microbial genomics and proteomics continue to be areas of real strength and expertise at PNNL and further development of this aspect of their research program is strongly encouraged. PNNL's other projects span the areas of low dose radiation research and structural biology. The largest single project continues to be in proteomics. This effort has made great progress the past year and appears to be on the verge of making a breakthrough to its goal of becoming a high throughput proteomics facility. The structural biology facilities in mass spectrometry and NMR spectrometry are productive and innovative. The other Life Sciences projects at PNNL are making good progress and have the potential to make substantial contributions to their fields.

**Criterion 2: Relevance to DOE Mission and National Needs**

Review by the Life Sciences Division

Numerical Rating: 3.8

**Adjectival Rating: Outstanding****Comments:**

PNNL's Life Science research projects are highly relevant to DOE and National needs in a variety of scientific areas.

**Criterion 3: Success in Constructing and Operating Research Facilities**

Review by the Life Sciences Division

Not applicable

Criterion 4: Effectiveness and Efficiency of Research Program Management

Review by the Life Sciences Division

Numerical Rating: 2.4

Adjectival Rating: Good

Comments:

Leadership in the broad areas of microbial genomics and proteomics is strong and has improved in FY 2002. There continues to be some disconnects between the broad systems biology goals of the Office of Biological and Environmental Research and PNNL but in some cases PNNL is trying to address the different research interests of both BER and NIH, a goal that is appropriate.

PNNL continues to have some difficulty attracting the top quality life scientists needed to best leverage the life sciences potential of EMSL, to attract strong collaborations with other national labs and universities, and to attract substantial new life sciences funding from BER. Overall, management of microbial and proteomics research has greatly improved in FY 2002 and now appears to be quite strong. Management in low dose radiation research still appears to be weak. The structural biology user support is managed reasonably well, although issues of record-keeping were noted by the merit review site visit panel early in Fiscal Year 2002. Science does not appear to be a high priority in the decision-making process at PNNL.

III. Review by the Medical Sciences Division (SC-73) FY 2002 Appraisal of Pacific Northwest National Laboratory

Criterion 1: Quality of Science & Technology

Review by the Medical Sciences Division

Numerical Rating: 3.5

Adjectival Rating: Excellent to Outstanding

Science: The magnetic resonance imaging/spectroscopy research team at PNNL has made significant contribution to the scientific community by developing advanced imaging technologies for living cells.

Technology: The development of an imaging technique called "PHORMAT" has made a significant impact on the use magnetic resonance spectroscopy for imaging biological tissues.

Criterion 2: Relevance to DOE Mission and National Needs

Review by the Medical Sciences Division

Numerical Rating 3.4

Adjectival Rating: Excellent

Comments:

The magnetic resonance research team utilizes the unique resources at PNNL (EMSL) which have resulted in significant scientific contributions to DOE's mission and to industry.

Criterion 3: Success in Constructing and Operating Research Facilities

Review by the Medical Sciences Division

Not Applicable for this project

Criterion 4: Effectiveness and Efficiency of Research Program Management

Review by the Medical Sciences Division

Numerical Rating 3.4

Adjectival Rating: Excellent

Comments:

The magnetic resonance research team has done an excellent job managing research funds provided by DOE for the project. The projected research plan for group consists of technical risks that are reasonable and capitalize on the unique equipment and resources available at PNNL.

IV. Review by the Environmental Remediation Sciences Division (SC-75) for the FY2002 Appraisal of PNNL

Criterion 1: Quality of Science and Technology

Review by the Environmental Remediation Sciences Division

Numerical Rating: 4.0

Adjectival Rating: Outstanding

Comments:

PNNL has excelled in the areas of bioremediation and subsurface science.

Criterion 2: Relevance to DOE mission and National Needs

Review by the Environmental Remediation Sciences Division

Numerical Rating: 4.0

Adjectival Rating: Outstanding

## Comments:

PNNL has done an outstanding job in making sure that their environmental cleanup programs are not only relevant to the mission, but imbedded in the Hanford site cleanup effort.

## Criterion 3: Success in constructing and operating research facilities

Review by the Environmental Remediation Sciences Division

Numerical Rating: 3.0

Adjectival Rating: Excellent

## Comments:

The Environmental Molecular Sciences Laboratory is not yet fulfilling its mission as a National Scientific User Facility. In particular, the user program is not as robust as we need. However, PNNL is restructuring the user program and we expect to see improvements in the near future. In addition, the EMSL needs to improve its management of the operations budget to be able to support unexpected needs (at least to some extent). The EMSL has done an excellent job in bringing in the new HP computer and has also received and tested the 900 MHz NMR this year.

## Criterion 4. Effectiveness and Efficiency of Research Program Management

Review by the Environmental Remediation Sciences Division

Numerical Rating: 3.5

Adjectival Rating: Excellent to Outstanding

## Comments:

PNNL needs to be recruiting in the areas of reactive transport modeling and actinide chemistry and has missed some opportunities to do so--this past year has been difficult because of leadership and organization changes. In addition, management needs to ensure that good scientific staff are not spread too thin. Research and coordination efforts associated with field studies at the Old Rifle UMTRA Site have been particularly noteworthy. In all other areas, PNNL has been excellent.

OFFICE OF BASIC ENERGY SCIENCES  
FY 2002 Science and Technology Performance Evaluation for  
Pacific Northwest National Laboratory (PNNL)

## Criterion 1: Quality of Science and Technology

Review by Basic Energy Sciences

Numerical Rating: 3.6

Adjectival Rating: Outstanding

## Comments

The Materials and Engineering Physics program at PNNL was subjected to written (mail) peer review during the first quarter of FY 2002. The overall program's quality of science and technology was judged to be excellent, and in some areas, outstanding. The reviews for the Defects and Defect Processes in Ceramics program were outstanding. The publication rate has been prolific. There is an appropriate blend of theoretical modeling and experimental effort. Dr. William Weber (PNNL) and Professor Rodney Ewing (University of Michigan) were given the Materials Research Society Best Paper Award for their presentation on "Radiation Effects in Crystalline Oxide Host Phases for the Immobilization of Actinides" at the MRS Symposium on Scientific Basis for Nuclear Waste Management XXV.

Reviews were highly complimentary on the Molecular Organized Nanostructural Materials program. One stated, "Any one aspect of their program would be impressive, but the integration of synthesis, characterization, and modeling is truly outstanding." The publication rate has been impressive. Reviews were excellent for the Chemistry and Physics of Ceramic Surfaces program. A method discovered by Dr. Scott Chambers and co-workers, described in the August 2, 2002 issue of Science, anchors ultrathin metallic cobalt layers on sapphire by using a surface chemical reaction that overcomes the island-formation problem. The tendency to form discontinuous metal films hinders our ability to form interfaces of ultrathin, laminar metal films on oxides for use in microelectronics and other technologies where nanostructural control is desired. The thin metal layer achieves epitaxial crystallinity after the deposition of only a few atomic layers. This new and inexpensive process should be applicable to a wide range of metals on metal oxides. Dr. Chambers and Dr. Donald Baer also received the Federal Laboratory Consortium Technology Transfer Award for Oxide Molecular Beam Epitaxy. Finally, reviewers generally rated the Irradiation Assisted Stress Corrosion Cracking program as excellent. The program addresses a critical fundamental issue encountered by the nuclear power industry. Dr. Stephen Bruemmer has served as an effective liaison with the radiation damage community, especially those involving reactors. He also received the 2002 Distinguished Service Award from the Structural Materials Division of The Minerals, Metals & Materials Society.

PNNL has provided outstanding technical collaboration to specific university principal investigators in the Department's EPSCoR Program. The laboratory sponsored "Advancing Energy Science and Technology through Partnerships," a DOE EPSCoR Workshop to Initiate and Develop Multi-institutional Research Teams, on June 5-7, 2002. The workshop was attended by about 150 scientists and faculty members, and was extremely successful.

The program in Chemical Physics at PNNL is outstanding. The research quality has been reviewed by external peers very positively: high quality, very relevant to the environmental issue that was the origin of the program, an ability to attract outstanding researchers, and very well-managed. The program integrates experiment and theory in a very positive manner with the result that significant advances in understanding at a molecular level are made. PNNL management has recognized the strength of the particular program and its relevance and importance to the future directions of the laboratory.

A review of the Molecular Processes program at PNNL was very positive. A lack of coordination between different parts of the laboratory in the theory area was noted, which the laboratory management took immediate steps to rectify.

The BES Geosciences program at PNNL supports outstanding basic research on computational, theoretical, and experimental surface geochemistry. New experimental and modeling projects were selected for funding in FY 2002 based on excellent peer reviewed proposals. These new projects bring collaborations with major university research groups that will contribute to the success of the PNNL effort.

Criterion 2: Relevance to DOE Missions and National Needs

Review by Basic Energy Sciences

Numerical Rating: 3.6

Adjectival Rating: Outstanding

Comments:

Research carried out by the BES programs at PNNL is highly relevant to the energy, environmental, science, and national security missions of DOE. For example, the coupling between the Materials and Engineering Physics program with technology programs at PNNL funded by the DOE Office of Energy Efficiency and Renewable Energy and the Office of Fusion Energy Sciences, as well as one funded by the Electric Power Research Institute, is extremely tight.

Criterion 3: Success in Constructing and Operating Research Facilities

Review by Basic Energy Sciences

Not Applicable.

Criterion 4: Effectiveness and Efficiency of Research Program Management

Review by Basic Energy Sciences

Numerical Rating: 3.6

Adjectival Rating: Outstanding

Comments:

The performance of Materials and Engineering Physics program coordinator at PNNL is outstanding. Dr. Gregory Exarhos is the leader of a focus area "Smart Materials Based on Electroactive Polymers" under the BES Division of Materials Sciences and Engineering supported distributed Center of Excellence for the Synthesis and Processing of Advanced Materials, which involves 10 national laboratories. He is also the co-leader on "Design and Synthesis of Tailored Nanostructures" under the jointly funded BES Division of Materials Sciences and Engineering and the National Nuclear Security Administration/Defense Programs distributed Nanosciences Network, involving five national laboratories. Dr. Exarhos organized a workshop on "Smart Materials Derived through Molecular Assembly" held in Santa Fe on September 29 - October 1, 2002 to integrate research activities in these two projects.

For the Chemical Physics program at PNNL, the recent management reorganization is expected to have a positive influence on the program. For the Molecular Processes programs, reorganization efforts were not carried out expeditiously and generated some concerns about the laboratory's commitment to these programs. However, the recent changes in management now seem to be positive.

OFFICE OF FUSION ENERGY SCIENCES  
FY2002 APPRAISAL OF PACIFIC NORTHWEST NATIONAL LABORATORY

Associate Director's Summary:

The fusion-related work at Pacific Northwest National Laboratory (PNNL) continues to focus on major tasks in the Fusion Materials Sciences Program of the Office of Fusion Energy Sciences (OFES). PNNL has demonstrated strong and effective leadership in key international collaborations on fusion materials research and remains at the forefront of research on composite materials for fusion. PNNL also continues to make important contributions to domestic and international research on vanadium alloy and ferritic steels, with a growing influence on approaches to the modeling of irradiation damage and helium effects in materials for fusion environments. The overall quality of PNNL work on fusion materials continues to be outstanding.

OVERALL RATING AND SCORE

Score: 3.8 - Outstanding

Goal 1: Quality of Science

Reviewer: Berk

Numerical Score: 3.8

Adjectival Rating: Outstanding

Comments:

The quality of PNNL work on fusion materials continues to be outstanding. PNNL has made many important contributions to the domestic and international efforts on modeling of irradiation damage and helium effects, on issues of ceramic composites (focusing on silicon carbide fibers in a silicon carbide matrix), on body-centered cubic metals (focusing on vanadium alloys and ferritic steels), and on face-centered cubic metals (copper alloys, austenitic steels, and Ni-based alloys). In the area of silicon carbide composites research, PNNL continues to be the lead US laboratory and has made numerous contributions to addressing the critical feasibility issues for the use of these materials in a fusion environment. Dr. Jones has provided strong and skillful leadership of the US community effort and is recognized internationally as a leader in the field. Dr. Kurtz has provided strong leadership in several areas of fusion materials research domestically and internationally. He has recently taken over leadership of the vanadium alloy research task under a US-Japan collaboration. During 2002, the scope of Dr. Kurtz's contributions expanded to include his leadership in the review of work on coatings for vanadium alloys. This effort led to significant changes in the approach to coatings research. In addition, Dr. Kurtz organized a very successful IEA workshop on advanced ferritic steels that has fostered new collaborations in this important field of fusion materials research. PNNL continues to be a strong leader in the miniaturization of irradiation specimens, which has yielded greatly increased productivity from irradiation testing of fusion materials. The PNNL research staff is very well respected in the international community and has produced numerous peer-reviewed publications in key areas of fusion materials research. PNNL's original and creative scientific output has advanced the science of fusion materials and has shown sustained progress and impact in the field. The PNNL staff is held in very high regard by the scientific community.

Goal 2: Relevance to DOE Missions or National Needs

Reviewer: Berk

Numerical Score: 3.8

Adjectival Rating: Outstanding

Comments:

Since the structural materials of fusion chambers are a major factor in the determining feasibility, economics, and environmental impact of fusion energy, the Fusion Materials Sciences Program is a key element of OFES. PNNL continues to focus its efforts on the most important tasks of the Fusion Materials Sciences Program, especially US participation in international bilateral collaborations (mainly, with JAERI and MEXT in Japan) and in multinational collaborations (mainly, with Europe, Japan, and the Russian Federation under the IEA Implementing Agreement on Fusion Materials). They are highly responsive to DOE and to fusion community input in setting the direction of their work.

Goal 3: Success in Construction and Operation of Facilities

Reviewer: Berk

Not Applicable

Goal 4: Effective and Efficient Research Program Management

Reviewer: Berk

Numerical Score: 3.8

Adjectival Rating: Outstanding

Comments:

PNNL is responsible for leading the Fusion Materials Sciences Program effort on silicon carbide composite research and in managing key elements of US-Japan collaborations on fusion materials. PNNL has also shared with DOE the task of conducting programmatic discussions and planning within the Materials Sciences Coordination Group. They continue to perform in a superior manner in these roles. PNNL made important contributions to the development of roadmaps and strategies for the Fusion Materials Program. They also shared leadership for developing plans for redirections that have put a greater emphasis on the theory and modeling of materials behavior and integration of the theory and modeling with experimental programs.

ADVANCED SCIENTIFIC COMPUTING RESEARCH  
FY 2002 APPRAISAL FOR PACIFIC NORTHWEST NATIONAL LABORATORY

- I. Review Prepared by: Mary Anne Scott, Program Manager for Collaboratories, MICS Division, SC-31  
FY 2002 Appraisal for Pacific Northwest National Laboratory

Criterion 1: Quality of Science and Technology

Review Prepared by: Mary Anne Scott, Program Manager for Collaboratories

Numerical Rating: 3.9

Adjectival Rating: Outstanding

Comments:

The laboratory is involved in three National Collaboratory projects-The DOE Science Grid, the Collaboratory for Multi-Scale Chemical Sciences (CMCS), and the Scientific Annotation Middleware (SAM) project-and in addition provides general

coordination support across all the National Collaboratory projects. Their work is excellent and their contribution to the enabling tools for collaboratories is outstanding. They are well recognized in the field of collaborative technologies with personnel called upon to serve in an advisory capacity for projects in this area supported by other agencies.

The DOE Science Grid (DSG) is aimed at defining, integrating, deploying, supporting, evaluating, refining, and developing (as necessary), the persistent Grid services needed for a scalable, robust, high-performance grid. It will provide DOE science applications and workflow systems persistent services for security, resource discovery, resource access, system monitoring. It is a collaboration of four laboratories (ANL, LBNL, PNNL, ORNL). Over the past year, the project has focused on one of the biggest problems in large-scale collaborations-a common authentication and security approach that allows researchers from all over the world to securely collaborate and share resources. The project, in collaboration with ESnet, has developed and implemented for several science applications a formal and scalable approach to issuing and managing identity certificates in order to support worldwide science collaborations.

The pilot Collaboratory for Multi-Scale Chemical Sciences (CMCS) brings together leaders in scientific research and technological development across multiple DOE laboratories, other government laboratories and academic institutions (SNL, PNNL, ANL, LANL, LLNL, NIST, MIT, UCB) with PNNL playing a key role in leadership for the project. Focusing on combustion research, the goal of the CMCS is to demonstrate that an integrated multi-scale approach to scientific and engineering research is not only possible but can produce significant benefits in harnessing research to address real-world issues. Advanced collaboration and metadata-based data management technologies are being used to develop an MCS (Multi-scale Chemical Sciences) portal providing community communications mechanisms and data search and annotation capabilities. This portal will also provide capabilities for defining and browsing cross-scale dependencies between data produced at one scale that is used as input for computations at the next. Development of use cases has been an effective approach for defining requirements of the portal. The SAM project is working very closely with this project on data issues.

Criterion 2: Relevance to DOE Mission and National Needs

Review Prepared by: Mary Anne Scott, Program Manager for Collaboratories

Numerical Rating: 3.9

Adjectival Rating: Outstanding

Comments:

The field of combustion is critical to the DOE mission for clean and efficient energy, and the DOE has ongoing investments in research across the full range of relevant scales and disciplines. The CMCS will bring an integrated, informatics-based approach to combustion research that enhances and begins to automate the flow of information between sub-disciplines.

Large-scale science projects such as those found in high energy physics, observational astronomy and astrophysics, all sorts of multi-disciplinary problems, national user facilities such as synchrotron light sources, etc., all share the problems of accommodating collaborators from all over the country, and around the world, and of managing and sharing huge amounts of data, sharing computing resources, etc. "Grids" are intended to provide a common infrastructure to support large-scale, collaborative, and widely distributed science and are the result of an international effort to define the basis of such infrastructure. The DOE Science Grid project is providing the research, development, and deployment of a "Grid" in support of DOE's Office of Science programs.

Criterion 3: Success in Constructing and Operating Research Facilities

Not applicable

Criterion 4: Effectiveness and Efficiency of Research Program Management

Review Prepared by: Mary Anne Scott, Program Manager for Collaboratories

Numerical Rating: 3.9

Adjectival Rating: Outstanding

Comments:

Planning and managing multi-institutional projects is challenging. These projects involve planning across multiple organizations. The CMCS project is a collaboration of eight national laboratories and universities and involves chemical scientists working with computer scientists, DSG is a collaboration of four national laboratories, and SAM is a collaboration of two national laboratories. Management on the projects has done an outstanding job in getting all the activities well-planned, integrated across institutions and has established mechanisms for tracking. In addition, the laboratory has been instrumental in assuring coordination and integration across all the national collaboratory projects.

II. Review Prepared by: Fred Johnson, MICS, SC-31

FY 2002 Appraisal for Pacific Northwest National Laboratory

Background: In FY2002, the ASCR/MICS Computer Science Program funded three efforts at PNNL that were begun in the preceding year: Participation in the Scalable Systems Software ISIC (emphasis on resource management and schedulers); participation in the Common Component Architecture ISIC (emphasis on scientific data components and computational chemistry applications); and participation in the base program Scalable Programming Models project (emphasis on expanded global array functionality and common runtime support).

CRITERION 1: QUALITY OF SCIENCE & TECHNOLOGY

Review Prepared by: Fred Johnson, MICS, SC-31

Numerical Rating: 3.7

Adjectival Rating: Outstanding

Comments:

All of these activities are making excellent progress. Global arrays continue to be of major interest and the PI organized and led a very successful workshop on runtime issues this past spring. Progress in scalable systems and common component architecture is excellent.

CRITERION 2: RELEVANCE TO DOE MISSION AND NATIONAL NEEDS

Review Prepared by: Fred Johnson, MICS, SC-31

Numerical Rating: 3.8

Adjectival Rating: Outstanding

Comments:

Global Arrays are the fundamental programming model used in NWChem, and NWChem is the prototype application development effort for the SciDAC program. A common component architecture for high performance parallel programming is a key step in achieving improved efficiency and ease of use for application programmers. Scalable systems software is essential for the effective management of extraordinarily large systems for scientific applications.

CRITERION 3: SUCCESS IN CONSTRUCTING AND OPERATING RESEARCH FACILITIES

Review Prepared by: Fred Johnson, MICS, SC-31

RATING: Not Applicable

CRITERION 4: EFFECTIVENESS AND EFFICIENCY OF RESEARCH PROGRAM MANAGEMENT

Review Prepared by: Fred Johnson, MICS, SC-31

Numerical Rating: 3.6

Adjectival Rating: Outstanding

Comments:

PNNL management is highly effective at working with CS program management.

Fax Transmission

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From: Watti Hill  
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Date: 12/12/02

Pages: \_\_\_\_\_, including this cover sheet

Subject:

Overall Performance

Thank you

# Appendix II

## **EM Evaluation of Battelle's Performance for FY-2002**

The following is a compilation of the input received from EM-50, DOE-RL, DOE-ORP, and TFA in response to the AMT October 23, 2002 request for a year end performance evaluation for Battelle, in the management and operation of PNNL. This evaluation looks at the activities that PNNL has performed for EM for FY2002 and has concluded that Battelle's rating is Outstanding in the areas of consideration for science and technology excellence. The following is a short justification of the above rating in the areas requested.

### **Quality of Science and Technology**

The Groundwater/Vadose Zone (GW/VZ) Science and Technology roadmap was updated this year to include remediation. PNNL activities resulted in an extraordinary percentage of 2002 EMSP research proposals being selected (funded) that support Hanford GW/VZ activities. The results of the last three years of S&T funded research (EMSP and Hanford Site funds) are being successfully integrated into the SST field investigation reports. The results of the research will resolve crucial technical issues concerning transport of tank waste contaminants through the vadose zone and groundwater.

PNNL's development, in conjunction with the Savannah River Technology Center of a new formula for vitrifying radioactive waste is expected to result in significant life-cycle savings with a lower operational risk. This new process showed a significantly faster process and technical advancement. Other notable technical accomplishments include the Pit Viper; a Modified Beta Gamma Detector; the Grapple Device and many technical assistance activities.

The systems assessment capability (SAC) development made significant progress this last year and will be available to support solid waste decisional documents and ORP needs in the coming year.

### **Relevance to Mission**

PNNL performed at an "Outstanding" level of performance this last year in the areas of groundwater monitoring, performance assessment (SAC) and GW/VZ science & technology.

PNNL was responsive and timely in responding to RL/ORP requests related to the Groundwater Monitoring Program. The reporting was accurate and timely. PNNL has also been responsive to client needs by providing periodic groundwater monitoring updates for the facilities they monitor.

PNNL's participation and leadership in the Cleanup Challenges and Constraints Team (C3T) has been extremely relevant to the DOE mission, was of high quality and added

tremendous value. The results of the C3T effort as well as the process itself have been seen as significantly impacting the acceleration of the Hanford Cleanup.

The PNNL participation and leadership in the TFA activities are critical to the cleanup mission of the Department. There were several technical assistance activities and workshops that were held that supported the mission and realized significant accomplishments.

The PNNL work in support of the Planning and Integration for the Waste Treatment Plant was relevant to DOE Mission needs and of a very high quality.

### **Effectiveness and Efficiency of Research Program Management**

PNNL did a good job preparing the Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement (HSW EIS) and providing support for public involvement activities in a timely manner. PNNL did have a problem with timely reporting of cost information (a problem now corrected).

The support to ORP and the Waste Treatment Plant has shown effective and efficient program management. The only issue was with the total cost of the PNNL support. These people (although they are very good) are very expensive due to the overheads applied to the work.

PNNL did an outstanding job during the transition of the EM-50 programs especially the Tanks Focus Area work that was successfully transitioned to the ORP Contractors. Agreements and relationships were quickly put into place, and there was a smooth and easy transition of both programs and staff. This allowed for continuity in the technical TFA knowledge base and future potential implementation of those technologies.

The EM-50 business that PNNL has had is significantly declining based on EM restructuring and reorganization. The direct support to ORP is also expected to significantly decline. PNNL is/has taken action to alleviate the impacts and continue the EM business through other avenues. The TFA work and transition of that work to other sponsors at the appropriate time during the fiscal year was critical to the successful maintenance of this critical workscope and capability.

The issues related to the Six Phase Soil Heating Intellectual Property rights and licensing were not handled quickly by PNNL. PNNL's business decision to take a significant equity position in the company that Commercialized the technology did not facilitate use of that technology. The EM program questioned PNNL's ongoing interference with application of that technology until a legal decision was reached.

PNNL's Institutional Plan has improved greatly in its attention to addressing and presenting EM science and technology aspects.

# Appendix III



**Department of Energy**  
**National Nuclear Security Administration**  
Washington, DC 20585

November 25, 2002

MEMORANDUM FOR: Paul W. Kruger, Associate Manager  
For Science and Technology

FROM: *K. Baker* Kenneth E. Baker  
Principal Assistant Deputy Administrator  
For Defense Nuclear Nonproliferation

SUBJECT: Request for HQ Year-End Performance Evaluation  
of Battelle for the Management and Operation of  
the Pacific Northwest National Laboratory (PNNL)  
for Fiscal Year (FY) 2002

In response to your letter, same subject as above, dated September 19, 2002, I am providing fiscal year 2002 performance evaluation input of Battelle related to their work in the area of Defense Nuclear Nonproliferation. Program performance was evaluated against three criteria: quality of technical support, relevance to the Office of Defense Nuclear Nonproliferation (NA-20) mission, and management effectiveness.

This feedback also summarizes verbal discussions held with Debbie Trader, Director, Laboratory Management Division, Richland Operations Office and with Mike Kluse, Associate Laboratory Director, National Security Directorate, Pacific Northwest National Laboratory, on October 22, 2002.

Battelle's overall performance for the Office of Defense Nuclear Nonproliferation is rated at Outstanding for FY 2002. PNNL conducts the highest quality work within National Security. I have the utmost confidence and trust in Battelle's leadership and in the work they perform. PNNL is often sought out and consulted for advice, ideas, and clarifications of issues.

**Quality of Technical Support – Outstanding**

The quality of technical support has been absolutely superb. Their work with the Office of Nonproliferation Research and Engineering has included successful research, testing of sensors, development of prototypes, and technology transfer. PNNL continues to support the Office of International Nuclear Safety and Cooperation as managers of the highly successful International Nuclear Safety Program. PNNL has also made significant contributions to the Office of Nonproliferation and International Security, the Office of International Material Protection and Cooperation, and the Office of Fissile Materials Disposition. The



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**DOE-RL/RLCC**

fact that NA-20 work has increased by more than 40% at PNNL in fiscal year 2002 is an indication of our trust and the value we put in their technical support.

**Relevance to the Office of Defense Nuclear Nonproliferation Mission – Outstanding**

PNNL's work is consistently relevant to our mission. They continue to be successful at forecasting and addressing NA-20 changing needs. PNNL's input is always relevant to the complex issues we face and is sought out and valued.  
**Management Effectiveness – Outstanding**

PNNL has outstanding leadership and management skills. The management team continues to be a great asset and is entrusted to go above and beyond doing well on programs. In an attempt to provide timely support to programmatic needs, PNNL recently made an honest mistake related to the Elimination of Weapons Grade Plutonium Production Program. It is our position that the magnitude of PNNL's outstanding work in reducing the threats to this nation greatly outweighs the administrative error that occurred in trying to do work as quickly as possible on this important program. PNNL's outstanding rating should not be downgraded because of this one error. PNNL management clearly continues to take ownership for program performance and leads by example.

If you have any questions, please contact me on (202) 586-0645.

cc: Julie Turner, DOE-RL

# Appendix IV

**From:** Ryder, Tom [mailto:Tom.Ryder@hq.doe.gov]  
**Sent:** Friday, December 13, 2002 1:05 PM  
**To:** 'Julie\_K\_Turner@RL.gov'  
**Subject:** RE: PNNL MATERIAL

I had asked my folks to re-iterate the key role PNNL is playing in the national security mission of the Department of Energy, both in the work done on behalf of our Congressionally-funded programs and in the intelligence work-for-others initiatives done for the warfighters and for the Intelligence Community. Indeed, in the last year, PNNL has been a real leader in demonstrating that collaborative efforts among the National Labs -- which some have been reluctant to undertake -- can lead to exciting new possibilities. PNNL put itself at some programmatic risk here: collaborative work is not the norm for DOE where "not invented here" syndrome is all too common even today. I think that at the most senior levels of the lab, there had to have been some corporate tongue-biting as the flagship project (which is highly classified so you will have to trust me on this one) hit a procedural snag or two (which was not the doing of PNNL). In each case, however, PNNL did not engage in finger-pointing; rather, it took a lead in forging consensus which in the very near future will result in the successful conclusion of this project which will bring great credit to the Department of Energy. In the coming year, I shall use this as an example of how teaming can work as we try to face the huge increase in demand for intelligence technology and assets.

PNNL has also been a leader in bringing new national security work to the Richland area. My colleagues in another agency were so impressed with the "can do" attitude of PNNL senior and mid-level management that they are considering a major investment at PNNL/Hanford. Keith Klein is well aware of the specifics of this process and the great strengths that PNNL has brought to bear throughout the process.

Finally, the versatility of PNNL at merging together numerous skill sets -- transparent to the user -- has led to the selection of PNNL to assist IN in its role in DOE deliberations about the future of the energy assurance program elements which may remain in the Department following the establishment of the new Department of Homeland Security. It is precisely because of its ability to quickly assess a situation, create an innovative solution to address it, and assemble diverse talents to produce a fully-fielded capability that PNNL was selected for this role.

In conclusion, from my perspective, I would rate PNNL at the "outstanding" level in the previous year. I would be very much lost without them.

# Appendix V



## Department of Energy

Washington, DC 20585

October 25, 2002

MEMORANDUM FOR PAUL W. KRUGER, ASSOCIATE MANAGER  
FOR SCIENCE AND TECHNOLOGY  
RICHLAND OPERATIONS OFFICE

FROM:

STEPHEN W. DILLARD, DIRECTOR  
OFFICE OF COUNTERINTELLIGENCE

SUBJECT:

Performance Evaluation of the Pacific Northwest  
National Laboratory for Fiscal Year 2002; Counterintelligence  
Program

In a September 11, 2002, letter you requested a written year-end rating of Battelle's performance during FY 2002, regarding the science and technological excellence of PNNL programs and activities as they relate to the following three criteria: (1) quality of technical support; (2) relevance to the Counterintelligence mission, and (3) management effectiveness. Using the adjective ratings you identified, I can rate, without reservation, Battelle's performance in each of these elements as **outstanding**. This rating applies to each of the program elements at PNNL who contribute to the Office of Counterintelligence's (OCI) national mission.

My evaluation is based on a review of the following information; the quarterly reports submitted by PNNL OCI program managers, the June 3-14, 2002, inspection of PNNL's Counterintelligence Organization, on-site reviews conducted in FY 2002 by the OCI management, the self-assessment recommended by PNNL's Senior Counterintelligence Officer (SCIO) that was incorporated in its Third Quarter Report for FY 2002, PNNL's response to surveys and special "taskings" requested from my office, and regular feed back from OCI Program Directors and other individuals interacting with PNNL staff assigned to CN matters on almost a daily basis. The PNNL OCI staff is professional, courteous, timely and thoroughly responsive to requests, and is overwhelmingly held in high regard by my staff. The OCI Inspector-in-Charge who conducted the June 2002 bi-annual inspection of PNNL's program described it as "...a mature, integrated program, with high morale, very productive, dedicated, and committed staff, with strong management and all elements in place and functioning effectively..." The June inspection also identified a number of "best practices" by elements from both the OCI as well as its Information / Special Technology Program (ISTP). Their final adjective rating ranks among the highest ever awarded.

### Quality of Technical Support:

The PNNL OCI staff has initiated special analytical and project initiatives that positively contribute to achieving Department of Energy, as well as, the Laboratory's goals to protect sensitive information and technologies from exploitation by hostile foreign



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intelligence services and/or terrorist organizations. They have also conducted issue relevant analytical reviews to determine risk and vulnerabilities pertaining to staff interactions involving foreign national visits and assignments, unsolicited or suspect electronic communications, and other contacts and project matters. PNNL's OCI has one of the most active and capable investigations programs in the DOE complex; this FY, 29 investigations were initiated and 24 were resolved. Several of those matters were "high profile" and all were investigated at the utmost levels of professionalism, conforming in all respects to applicable laws, rules, regulations and policies. They have successfully developed an "audience specific" and "staff oriented" awareness program, and more recently enhanced their employee outreach efforts by developing an internal website to assist staff in the ready retrieval of issue relevant CI information. On the ISTP side, PNNL OCI staff completed, on schedule, the implementation of the initial phase of the IMAC and established dedicated facilities, staff, and operational protocols to support its Operations Analysis Center (OAC). The PNNL ISTP also developed a standard training model covering CI awareness issues applicable for cyber work performed by the system administrator population.

#### **Relevance to the OCI Mission:**

PNNL has fully integrated key elements of OCI's 2002 Strategic Plan into all aspects of CI project management, and its CI Program is a positive contributor to the critical outcomes defined in the Laboratory's Institutional Plan. The PNNL SCIO provided significant support to OCI in its 2002 re-draft of its national CI Strategic Plan and chaired a working group that defined the role of DOE's CI Awareness Sub-Program in that Strategic Plan. Further, PNNL OCI staff were active participants in technical and policy committees for DOE and the Laboratory. Through the efforts of a special team assembled by the PNNL to support OCI's ISTP, the IMAC OAC enhanced the value added quality of cyber intrusion data through the production of Intelligence Information Reports directed toward members of the Intelligence Community, and other special reports that supported threat analysis conducted by DOE OCI staff at other national laboratories and field sites. It should also be noted that the PNNL SCIO has enhanced Intelligence Community liaison channels by developing an active role for the OCI Program in the Northwest Counterintelligence Coordinating Committee.

#### **Management Effectiveness:**

The priorities and strategies promulgated by PNNL's OCI elements are based on effective integration in the program's key function areas and full coordination with all OCI resources. The PNNL OCI Program researched and published the first comprehensive regional CI threat assessment that addressed potential hostile foreign intelligence collection efforts at the Laboratory, the Hanford Site, and the Richland Operations Office, described during the PNNL CI Program inspection as "the best we've seen." On the ISTP side, PNNL developed a new model that integrated CI cyber expertise into traditional CI investigative and analytical functions, and instituted a new and unique CI cyber relevant data collection and analysis process for CI threat review. Last, and most important, the PNNL – in particular Mike Kluse and the National Security

Division -continued its progress toward growing a CI work force of excellence through on the job mentoring and special training initiatives.

Based on all the information available to me, to include my own interaction and observation of the Program at this Laboratory, I provide this outstanding rating for the FY 2002 rating period.

Should you have any questions concerning this matter, please contact me at (202) 586-5901.

**Angulo, R P Jr (Michael)**

---

From: McLeod, Robert G (Bob)  
Sent: Monday, October 28, 2002 2:35 PM  
To: Angulo, R P Jr (Michael)  
Subject: FW: Year-End Performance Evaluation of Batelle for the Management and Operation of the PNNL...

Importance: High



KRUGERMemo.pdf

-----Original Message-----

From: Turner, Julie K  
Sent: Monday, October 28, 2002 8:22 AM  
To: McLeod, Robert G (Bob); Mamiya, Lance S  
Subject: FW: Year-End Performance Evaluation of Batelle for the Management and Operation of the PNNL...  
Importance: High

FYI - julie

-----Original Message-----

From: Kruger, Paul W  
Sent: Monday, October 28, 2002 7:42 AM  
To: Erickson, Julie K; Trader, Deborah E; Turner, Julie K  
Subject: FW: Year-End Performance Evaluation of Batelle for the Management and Operation of the PNNL...  
Importance: High

..good letter!

Thanks,...  
PW Kruger  
DOE-AMT/PNNL Site Office  
Phone: (509) 372-4005  
Fax: (509) 372-4532  
E-mail: [mailto:paul\\_w\\_kruger@rl.gov](mailto:paul_w_kruger@rl.gov)

-----Original Message-----

From: FRANCES.COLE@CN.DOE.GOV [mailto:FRANCES.COLE@CN.DOE.GOV]  
Sent: Monday, October 28, 2002 7:11 AM  
To: Paul\_W\_Kruger@rl.gov; Robert\_G\_McLeod@rl.gov  
Subject: Year-End Performance Evaluation of Batelle for the Management and Operation of the PNNL...  
Importance: High

Attached is the Director of the Office of Counterintelligence's Performance Evaluation of PNNL for FY 2002; Counterintelligence Program:  
(See attached file: KRUGERMemo.pdf)

\*\*\*\*\*  
Frances M. Cole  
Office of Counterintelligence  
Room 8F089 Forrestal Bldg.  
(202) 586-4706  
\*\*\*\*\*

# Appendix VI

In response to the FY02 EERE Evaluation Request for Input letter sent on September 19, 2002, the following fiscal year 2002 performance evaluation input of Battelle related to their work in the area of Energy Efficiency and Renewable Energy. Program performance was evaluated against three criteria: Quality of technical support, relevance to the Office of Energy Efficiency and Renewable Energy (EERE) Mission, and Management Effectiveness.

This feedback also summarizes verbal discussions held with EERE management and staff, DOE-HQ and with Mike Lawrence, Associate Laboratory Director, Energy Science & Technology Directorate.

Battelle's overall performance for the Office of Energy Efficiency and Renewable Energy is rated at Outstanding for FY 2002. PNNL has provided good support. The laboratory is viewed as a corporate/analytic standard.

#### Quality of Technical Support – Outstanding

PNNL has been very instrumental and supportive in improving the Nation's Energy Systems via Distributed Energy and Energy Systems, High-Efficiency Transportation Systems, and Bio-based Products and Processes. The laboratory is a leader in the development of the capability to enable a transformation in reliability, capability, and efficiency of the nation's electricity grid. PNNL staff wrote the advanced technology options chapter in the National Transmission Grid Study released by Secretary Abraham in May 2002. PNNL has developed several processes that enable lightweight materials to reduce automotive and heavy-vehicle weight.

#### Relevance to the Office of Energy Efficiency and Renewable Energy Mission – Outstanding

The lab has effectively supported the goals and mission of EERE. Through its involvement and commitment to the DOE Transmission Reliability Program and the President's National Energy Plan, PNNL was instrumental in developing a strategy to enhance Hanford's contribution to National Energy Plan goals and regional energy issues. They have consistently contributed to the mission of Hydrogen, Fuel Cells, and Infrastructure Program by participating in the 2002 U.S. DOE Hydrogen and Fuel Cells Annual Program. They are also in collaborative efforts with the National Energy Technology Laboratory (NETL) and the Hydrogen Program to deal with essential power systems based upon solid oxide fuel cells (SOFC) for heavy trucks. PNNL has contributed significantly to the DOE Combustion and Emission Control Programs through its work in emissions chemistry. The lab has initiated three new projects in support of the multi-laboratory effort and in meeting 2007 emissions standards. PNNL also directly supports DOE's lead role in the 21<sup>st</sup> Century Truck Partnership. The lab's staff has consistently supported the goals and missions of the Office of Freedom Car and Vehicle Technologies (OFCVT). The lab has also become involved in research that assists the Office of Biomass Programs in meeting its major goals, which include: 1) reducing dependence on imported petroleum, and 2) helping establish integrated biorefineries that produce a combination of products, fuels, and power.

#### Management Effectiveness – Outstanding

The laboratory continues to demonstrate leadership and innovation in managing EERE projects. They provide science and engineering that encourages significant improvements in the

technological area. The lab emphasizes technology and systems innovations that target improvements in energy infrastructure and security, and the development of low-cost, high performance, solid oxide fuel cells, hybrid fuel cell systems, energy storage systems, bio-based products, and essential technology for a hydrogen economy.

FY 2002 was critical transition year for DOE's EERE with several significant changes to strategic budget priorities and organizational structure. As a result, PNNL made some key strategic changes during FY 2002 to align itself with the new structure and to enhance its alignment with the programs.

# Appendix VII

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: PNNL PROGRAM: FE  
 B&R (s): AA1510100  
 EVALUATOR Udaya Rao FY2002 Funding: \$450,000  
 DATE: 10/9/2002

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

The project is addressing the engineering challenge of how to effectively incorporate materials known as mixed ionic/electronic conducting (MIEC) oxides into practical devices. However, because MIEC-based device technology is essentially restricted to high temperature operation, only a limited number of joining technologies are applicable. The project is uncovering promising methods to fill this gap. For example, reaction air brazing using Ag-CuO and Ag-CuO-TiO<sub>2</sub> brazes was investigated as an alternative means of joining a mixed ionic/electronic conducting oxide, (La<sub>0.6</sub>Sr<sub>0.4</sub>)(Co<sub>0.2</sub>Fe<sub>0.8</sub>)O<sub>3</sub>, to a structural alloy candidate, ferralloy, for an oxygen generator application. In general, it was found in the Ag-CuO brazes that the formation of a nearly continuous CuO layer along the interface with either substrate greatly improves the wetting characteristics of the braze. These results are promising and a series of joining experiments have been initiated using the binary RAB brazes should fully demonstrate their potential.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

Because of their properties, the demand for MIEC oxide-based devices has grown considerably. The value of the present-day market is conservatively estimated to be \$3 billion, with particularly high growth rates in automotive systems, environmental control, and energy generation technology where the devices are employed primarily as amperometric chemical sensors. Solid oxide fuel cells (SOFCs) represent an even larger potential market than that established for chemical sensors. Opportunities to fully exploit the unique properties of these advanced ceramics depend in large part on the ability to develop reliable joining techniques.

The project is aligned with the development of those technologies that are potential elements of the DOE-FE Vision 21 concept, which aims to address and solve environmental issues and thus remove them as a constraint to coal's continued status as a strategic resource. The advanced power systems concepts being pursued under Fossil Energy's Vision 21 are directed toward very high efficiency and low emissions, particularly of carbon dioxide. Many of these systems depend on the ability to separate hydrogen, oxygen, or carbon dioxide from mixtures containing these gases. Because of the very high overall efficiency and cost goals, R&D is indicated on gas separations that are significant improvements over conventional methods/systems. Sealing technology being developed at PNNL is an important aspect of this effort.

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

N/A

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

PNNL has played a key role in developing functional ceramic materials that will lead to more efficient utilization of fossil fuels. The project has evaluated the stabilities of materials and interfaces in solid oxide fuel cells and developed ion-conducting ceramics for oxygen separation from air. The project has kept abreast of the goal of developing materials for increased efficiency, longer lifetimes, and lowered cost of manufacture of solid oxide fuel cells and ceramic gas separation membranes. Alternative electrolyte, electrode, and sealing materials that would enable operation at reduced temperature and/or at higher efficiencies are being successfully addressed.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

### RATINGS\*

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**Overall Evaluation:** (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

The project has set an example in exploratory research whose aim is to generate new materials, ideas and concepts which have the potential to significantly improve the performance or cost of existing fossil systems or enable the development of new systems and capabilities. Consequently, developing improved materials for devices employing high-temperature inorganic membranes constitute major objectives of the program. An essential feature of the FE Materials program is the construction of a materials technology base and facilitation of technology transfer to meet the needs of high-efficiency fossil energy systems and the PNNL effort has provided valuable support to this goal.

Summarize Any Programmatic Issues and/or Recommendations:

The program funds the development of materials for new systems and capabilities. Partnering and cost sharing with industry are central components of this program. In this regard, PNNL should make a greater effort in obtaining industrial support and involvement in the research being carried out.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: Pacific NorthwestPROGRAM: FEB&R (s): AA1035000FY2002 Funding: \$50,000EVALUATOR Daniel CiceroDATE: October 22, 2002

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

The quality of the work by PNNL as part of the ITM Syngas/ITM Hydrogen project was excellent. Proper scientific procedures and methods were used, and new glass-ceramic joining compositions were developed which successfully passed initial screening tests.

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

O E G M U

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

The work by PNNL to develop glass-ceramic joining compositions was very relevant to the technical objective of joining ceramic components, which is a necessary step in fabricating ceramic membrane modules. The ITM Syngas/ITM Hydrogen process has the potential for greater than 30% capital cost savings compared to conventional methods for producing synthesis gas (a mixture of hydrogen and carbon monoxide) from natural gas.

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

PNNL met the technical objectives and developed new glass-ceramic joining compositions which successfully passed initial screening tests.

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Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

PNNL was on-time and on-budget in completing their scope of work as part of the ITM Syngas/ITM Hydrogen project. Quality of PNNL technical reports was excellent.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

The quality of the work by PNNL as part of the ITM Syngas/ITM Hydrogen project was excellent. The ability to join ceramic components is a necessary step in fabricating ITM Syngas/ITM Hydrogen ceramic membrane modules and the work by PNNL was a key part of the approach to meet this objective. PNNL met the technical objectives and developed new glass-ceramic joining compositions which successfully passed initial screening tests.

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Summarize Any Programmatic Issues and/or Recommendations:

No comments.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY:\_\_\_PNNL\_\_\_\_\_

PROGRAM: Advanced Research

B&amp;R (s):\_\_\_AA1520350\_\_\_\_\_

FY2002 Funding:\_\_\_180K\_\_\_\_\_

EVALUATOR \_Heino Beckert \_\_\_\_\_

DATE:\_\_\_10/15/02\_\_\_\_\_

## EVALUATION FACTORS

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**Please note:** This project (FWP# 44468 – “Selection of Microalgal Species that Maximize Biofixation of Carbon Dioxide from Powerplant Flue Gases”) was just started in early October 2002. Therefore, no other information other than what is given above is available at this time.  
**Heino Beckert.**

1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

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Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: Pacific Northwest National Laboratory PROGRAM: Hydrates

PROJECT: Characterization of Methane Hydrate Bearing Sediments and Hydrate

Dissociation Kinetics

Project Number: FWP42723

B&amp;R (s): AB0565000

FY2002 Funding: \$40,000

EVALUATOR John D. Rogers

DATE: October 22, 2002

## EVALUATION FACTORS

## RATINGS\*

O E G M U

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments: This particular program has shown innovative and gets results.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments: This project is one of the few if not the only project in the national hydrates lab program that manages the project on schedule and on time for the funds appropriated. The facilities appear to be fully utilized to accomplish the tasks. Milestones completed on time and accomplished within reasonable agreed budgets. The project management coordinates and collaborates with the international scientific community to the benefit of the project and overall program and without straying from the tasks and maintaining focus of the project and program.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

This project has demonstrated a clear understanding of the program needs and has given the department a clear benefit for the cost incurred. The effort to the hydrates program and benefit has been shown in the technology that is being asked for by industry to help develop and understand the hydrates phenomena. The PI and organization was responsive to the funding agency and cooperated to keeping the Project Manager of DOE informed as to what was developing, accomplishments, moneys spent, activity, and problems incurred.

Summarize Any Programmatic Issues and/or Recommendations:

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: Pacific Northwest National Laboratory PROGRAM: Hydrates

PROJECT: Gas Hydrates

Project Number: FWP42724

B&amp;R (s): AB0565000

FY2002 Funding: \$150000

EVALUATOR John D. Rogers

DATE: October 22, 2002

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:


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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

This project seems to have difficulty staying focused on the program and needs of the program.

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Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: Pacific NorthwestPROGRAM: NG Infrastructure ReliabilityB&R (s): AB0545000FY2002 Funding: \$250,000EVALUATOR Rondle HarpDATE: October 17, 2002

## EVALUATION FACTORS

## RATINGS\*

O      E      G      M      U

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:


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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

	RATINGS*				
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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

Not rated, this criteria does not relate to the work performed under the specific project conducted with which this rater has experience.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

O      E      G      M      U

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

Not rated, this criteria does not relate to the work performed under the specific project conducted with which this rater has experience.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:


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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

This rating is based on limited experience through a single project funded through the Natural Gas Infrastructure Reliability program. Some of the rating criteria were at a much higher level and do not relate well to this limited experience.

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Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: \_\_\_\_\_ PNNL \_\_\_\_\_

PROGRAM: Adv. Pwr. SOFCs

B&amp;R (s): AA2530000 \_\_\_\_\_

FY2002 Funding: \$2950k \_\_\_\_\_

EVALUATOR Lane Wilson (NETL/OPM \_\_\_\_\_

DATE: 10/18/02 \_\_\_\_\_

FWP 40552 SOFCs – SECA Core Technology – PNNL

Note: This is jointly managed by Lane Wilson and Donald Collins.

## EVALUATION FACTORS

## RATINGS\*

O E G M U

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

PNNL has assembled a group of researchers to address the materials related SECA core technology areas of SOFC cathodes, anodes, seals, and interconnects. The PT's are recognized in the SOFC community as well as their respective materials related disciplines. They publish in research journals and present papers at related conferences.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

O E G M U

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

The PNNL fuel cell effort is relevant to the DOE mission and is responsive to the DOE SECA program goals. The PNNL materials effort covers the key technology issues that need to be resolved to meet the SECA goals. PNNL's involvement and familiarity with the various industrial teams will enhance technology transfer of their research results.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

Not applicable to this project.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

Similar to area 2 (see above). The project is responsive to DOE SECA program goals. The PIs are aware of and receptive to DOE program requirements. They have made adequate progress in the time period established.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

As stated above, the work by the PI's is timely, good science, and has relevance to the DOE SECA program goals. They have made significant contributions to the evolution of SOFC technology. A prime example is the development of a anode material that is stable with regard to oxygen cycling and shows promise for sulfur tolerance and carbon buildup resistance. Similar breakthroughs are anticipated in the other materials areas they are working on.

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Summarize Any Programmatic Issues and/or Recommendations:

The flexibility to dynamically shift the magnitude of the research effort from one sub-topic to another would be a plus as the relative importance of each sub-topic changes from year to year. Priorities should be set in response to the aggregate, pre-competitive research needs of the SECA industrial teams.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: \_\_\_\_\_ PNNL \_\_\_\_\_

PROGRAM: Adv. Pwr. SOFCs

B&amp;R (s): \_\_\_\_\_ AA2530000 \_\_\_\_\_

FY2002 Funding: \_\_\_\_\_ \$2950k \_\_\_\_\_

EVALUATOR \_\_\_\_\_ Lane Wilson (NETL/OPM) \_\_\_\_\_

DATE: \_\_\_\_\_ 10/18/02 \_\_\_\_\_

FWP 40552 SOFCs – SECA Core Technology – PNNL

Note: This is jointly managed by Lane Wilson and Donald Collins.

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

PNNL has assembled a group of researchers to address the materials related SECA core technology areas of SOFC cathodes, anodes, seals, and interconnects. The PI's are recognized in the SOFC community as well as their respective materials related disciplines. They publish in research journals and present papers at related conferences.

Currently, PNNL leads the community in developing modeling and simulation tools to enable more effective progress in the research and development of fuel cell components and power generation systems. Numerous reports, presentation and software modeling files have been published in an effort to disseminate the results to those that can use and apply the new modeling tools. In this position PNNL performs as the leader to integrate the efforts of other organizations in further developing the features and functionality of the modeling tools to address needs of users and incorporate research advancements.

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

The PNNL fuel cell effort is relevant to the DOE mission and is responsive to the DOE SECA program goals. The PNNL materials effort covers the key technology issues that need to be resolved to meet the SECA goals. PNNL's involvement and familiarity with the various industrial teams will enhance technology transfer of their research results.

The modeling and simulation tools being developed are being used to accelerate the development of fuel cell technologies that when available will reduce the need to import oil. In addition, the technology advancements enabled by these tools will better enable the military to utilize and exploit the advantages of fuel cell technology. Accelerating and leading the development of fuel cell technology is seen a means to significant reduce environmental pollution associated with power generation. This will also enable the U.S. to gain and sustain a strong lead on fuel cell technology and thereby enable capture of market share both domestic and foreign. This should improve the U.S. foreign trade deficit by increasing exports of power generation systems and also by decreasing fuel imports.

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\*Ratings:      O=Outstanding;      E=Excellent;      G=Good;      M=Marginal;      U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

Not applicable to this project.

RATINGS\*

O      E      G      M      U

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

Similar to area 2 (see above). The project is responsive to DOE SECA program goals. The PIs are aware of and receptive to DOE program requirements. They have made adequate progress in the time period established.

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\*Ratings:      O=Outstanding;      E=Excellent;      G=Good;      M=Marginal;      U=Unsatisfactory

RATINGS\*

O      E      G      M      U

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	X			
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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

As stated above, the work by the PI's is timely, good science, and has relevance to the DOE SECA program goals and national priority initiatives. They have made significant contributions to the evolution of SOFC technology. A prime example is the development of an anode material that is stable with regard to oxygen cycling and shows promise for sulfur tolerance and carbon buildup resistance. Similar breakthroughs are anticipated in the other materials areas they are working on.

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Summarize Any Programmatic Issues and/or Recommendations:

The flexibility to dynamically shift the magnitude of the research effort from one sub-topic to another would be a plus as the relative importance of each sub-topic changes from year to year. Priorities should be set in response to the aggregate, pre-competitive research needs of the SECA industrial teams.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: PNNLPROGRAM: SequestrationB&R (s): AA3010000EVALUATOR Sean PlasynskiFY2002 Funding: \$100KDATE: 10/3/02

## EVALUATION FACTORS

## RATINGS\*

O E G M U

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

— This is a new project and it was only sent funds in Sept. and thus did not have any time to perform any of the work in FY02. Therefore, I am not able to evaluate the performance of this work for FY02. The project is worthwhile and thus the sequestration program is awaiting the results.

**Project: FWP 44360 Fossil Energy Technology Strategy \$100K**

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

	RATINGS*				
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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

O E G M U

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals

Comments:

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS\*  
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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

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Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: \_\_\_\_\_PNNL\_\_\_\_\_

PROGRAM: Adv. Pwr. SOFCs

B&amp;R (s): \_\_\_\_\_AA2530000\_\_\_\_\_

FY2002 Funding: \_\_\_\_\_\$271k\_\_\_\_\_

EVALUATOR Lane Wilson (NETL/OPM)

DATE: \_\_\_\_\_10/18/02\_\_\_\_\_

FWP 43472 SOFCs – International and University Activities

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

The PI, Dr. S. Singhal has a track record in SOFC materials development and is recognized as a contributor in the SOFC community. He has initiated several international forums for the exchange of information with regard to SOFC research. He is the organizer of the main symposium for SOFC and is the editor of the proceedings.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

The PNNL fuel cell effort is relevant to the DOE mission and is responsive to the DOE SECA program goals. Dr. Singhal has encouraged the PNNL group to disseminate their research findings at domestic university and international forums. The exchange of ideas that this effort facilitates contributes to the research progress that helps enable SECA program progress.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*  
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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

Not applicable to this project.

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\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

Similar to area 2 (see above). The project is responsive to DOE SECA program goals. The PI is aware of and receptive to DOE program requirements and has worked to generate excitement in the academic research community with regard to SECA research goals. The PI has made adequate progress in the time period established.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

As stated above, the work by the PI is timely, supportive, and has relevance to the DOE SECA program goals.

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Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: PNNLPROGRAM: Distributed Generation Systems,  
Innovative ConceptsB&R (s): AA2530000FY2002 Funding: \$250,000EVALUATOR: William C. SmithDATE: 10/22/02

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

- ☐ Electrochemical measurement techniques were established that allowed each of the contributions to cell resistance to be distinguished in solid oxide fuel cells. Contributions to cell resistance includes cathode and anode reactions, ohmic losses due to the electrolyte and electrodes, and fuel and air utilization.
- ☐ Interfacial solid-solid reactions between the electrolyte and cathode were related to fuel cell performance. These microscopic reaction products were identified by scanning transmission electron microscopy.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

RATINGS*				
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X				

Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

- ☐ Partnered with McDermott Technology Inc. and Cummins under a CRADA agreement, research conducted by PNNL is directed at developing a commercially viable solid oxide fuel cell system, with potential applications in transportation, distributed electrical generation, and defense. This research, and research conducted by other members of the MTI/Cummins development team, directly impacts Department of Energy goals in reducing the nation's dependence on foreign sources of fossil fuels.
- ☐ Research conducted by PNNL on this CRADA with MTI/Cummins has helped to identify limitations to overall solid oxide fuel cell performance for the specific design being developed by this team. These results have enabled significant improvements in fuel cell performance to be realized.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

- ☐ This category is not applicable to the subject project, a CRADA involving McDermott Technology, Inc., Cummins, and the University of Missouri-Rolla.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

- ☐ Planned tasks were completed within the schedule and budget agreed to by the Department of Energy and CRADA partners McDermott Technology, Inc. and Cummins Power Generation.
- ☐ Close collaborations among the partners were maintained through twice-monthly conference calls and quarterly technical review meetings held in Salt Lake City, in addition to less formal communications. Status reports detailing technical progress have been provided to the CRADA partners.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

- ☐ Significant technical progress has been achieved with regard to understanding various limitations to solid oxide fuel cell performance for the specific design being developed by the McDermott Technology, Inc./Cummins Power Generation team. This information has proved valuable in optimizing fuel cell performance.
- ☐ Research conducted by PNNL under this CRADA has been on schedule and within the allotted budget.
- ☐ Close collaborations between the partners has been maintained throughout this project, through regular technical exchanges.

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Summarize Any Programmatic Issues and/or Recommendations:

Planning for follow-on research and development should be completed during the first quarter of FY 2003.

There were no additional funds to continue this effort in FY-03. If funds became available, this effort should be continued.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: \_\_\_\_\_ PNNL \_\_\_\_\_

PROGRAM: \_\_\_\_\_ Sequestration \_\_\_\_\_

B&amp;R (s): \_\_\_\_\_ AA3010000 \_\_\_\_\_

EVALUATOR \_\_\_\_\_ John Ruether \_\_\_\_\_

FY2002 Funding: \_\_\_\_\_ 10K \_\_\_\_\_

DATE: \_\_\_\_\_ Sept. 30, 2002 \_\_\_\_\_

## EVALUATION FACTORS

## RATINGS\*

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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

PNNL prepared maps of Enhanced Oil Recovery facilities that use CO<sub>2</sub> in the U.S. and of promising prospects for extending the application of CO<sub>2</sub> EOR. They also prepared commentary on the same subjects. Their maps are state of art, employing GIS.

\*Ratings:      O=Outstanding;      E=Excellent;      G=Good;      M=Marginal;      U=Unsatisfactory

## RATINGS\*

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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

Assessing the prospects for combining CO<sub>2</sub> EOR with coal gasification/combined cycle for power generation is important for allowing continued use of coal while substantially reducing greenhouse gas emissions from the power sector.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

Not applicable.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

It was sometimes difficult for workers at NETL to make contact with workers at PNNL. Telephone and email messages were not always answered promptly.

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

O      E      G      M      U

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	x			
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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

Excellent support was furnished by PNNL in describing the potential for collection and sale of CO<sub>2</sub> from electric generators for use in CO<sub>2</sub> EOR. The combined effort of NETL and PNNL has resulted in three conference presentations.

---

Summarize Any Programmatic Issues and/or Recommendations:

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\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## EVALUATION FORM FOR PROGRAMMATIC APPRAISALS

LABORATORY: PNNLPROGRAM: Distributed Generation SystemsB&R (s): AA2525000EVALUATOR Norman HolcombeFY2002 Funding: \$1,750,000DATE: 9/30/02

## EVALUATION FACTORS

## RATINGS\*

O      E      G      M      U

		X			
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1. Quality of Science. Review committees will consider recognized indicators of excellence, including impact of scientific contributions, leadership in the scientific community, innovativeness, and sustained achievement. As appropriate, they may also evaluate other performance measures such as publications, citations and awards.

Comments:

This work has only been going since 7/02. However, it appears on track and good science will come from it.

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

O E G M U

	X				
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2. Relevance to National Needs and Agency Missions. Committees will consider the impact of Laboratory research and development on the mission needs of the Department of Energy and other agencies funding the programs. Such considerations include national security, energy policy, economic competitiveness, national environment goals, as well as the goals of DOE and other Laboratory funding agencies in advancing fundamental science and strengthening science education. Committees will assess the impact of Laboratory programs on industrial competitiveness and national technology needs. As appropriate, they may consider such performance measures as licenses and patents, collaborative agreements with industry, and the value of commercial spin-offs and effectiveness of outreach efforts to industry.

Comments:

PNNL is conducting research in critical areas of fuel cell research.

\*Ratings: O=Outstanding; E=Excellent; G=Good; M=Marginal; U=Unsatisfactory

## RATINGS\*

O      E      G      M      U

	X			
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3. Performance in the Technical Development and Operation of Major Facilities. Elements to be considered: Performance measures include success in meeting scientific and technical objectives, technical performance specifications, and user availability goals.

Comments:

This effort has been going on since 7/02. However, it is on track as I expect it will do well.

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

RATINGS\*

O    E    G    M    U

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	X			
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4. Programmatic Performance and Planning. The review should focus on the achievement of broad programmatic goals, including meeting established technical milestones, carrying out work within budget and on schedule, satisfying the sponsors, planning for the orderly completion or continuation of the programs, and appropriate publication and dissemination of scientific and technical information. In assessing the effectiveness of programmatic and strategic planning, the reviewers may consider the ability to execute projects in concert with overall mission objectives, programmatic responsiveness to changes in scope or technical perspective, and strategic responsiveness to new research missions and emerging national needs. In the evaluation of the effectiveness of programmatic management, consideration may include morale, quality of leadership, effectiveness in managing scientific resources (including effectiveness in mobilizing interdisciplinary teams), effectiveness of organization, and efficiency of facility operations.

Comments:

This effort has been going only since 7/02. However, it is within budget and on schedule.

---

\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory

## RATINGS\*

O      E      G      M      U

	X			
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Overall Evaluation: (Overall ratings of Outstanding, Marginal, or Unsatisfactory especially require a narrative explanation citing significant accomplishments or deficiencies to substantiate the rating.)

Summarize basis for this rating.

This effort has been only going since 7/02, but it is progressing nicely.







Summarize Any Programmatic Issues and/or Recommendations:







\*Ratings:    O=Outstanding;    E=Excellent;    G=Good;    M=Marginal;    U=Unsatisfactory


**Angulo, R P Jr (Michael)**

---

**From:** Williams, Kimberly L  
**Sent:** Thursday, November 14, 2002 9:48 AM  
**To:** Angulo, R P Jr (Michael)  
**Subject:** FW: PNNL Performance Evaluation for the Office of Fossil Energy

 aa151010.doc      APCI's-PNNL\_ST  
EvalForm 02.doc...      Evaluation-PNNL-FWP  
#44468.doc      FWP42723\_  
MCgrail.doc      FWP42724\_He.doc      PNNL EvalForm  
02.doc

 PNNL2evalWilson.doc      PNNL2evalWilsonColli  
ns.doc      PNNL-44360-rev-fy021  
.doc      PNNLevalWilson.doc      PNNLself.doc      ST EvalForm 02.doc

 ST EvalForm 02\_1.doc

Kimberly L. Williams, Program Manager  
Laboratory Management Division  
(509) 372-4829 (o)  
(509) 372-4549 (f)

-----Original Message-----

From: Turner, Julie K  
Sent: Friday, October 25, 2002 10:28 AM  
To: Trader, Deborah E; Williams, Kimberly L  
Subject: FW: PNNL Performance Evaluation for the Office of Fossil Energy

Input from FE for Critical Outcome 1.0.

What do we do with a rating "between excellent and outstanding" ? Use a value point of 3.5 for the calculation (Outstanding = 4, Excellent = 3)? *use 3.5 per 11-28-02*

Any thoughts?

Julie

-----Original Message-----

From: Singer, Marvin [mailto:Marvin.Singer@HQ.DOE.GOV]  
Sent: Friday, October 25, 2002 10:28 AM  
To: 'julie\_k\_turner@rl.gov'  
Cc: Rudins, George  
Subject: PNNL Performance Evaluation for the Office of Fossil Energy

Julie:

Attached are the individual project manager evaluations for FE's work at PNNL. Two projects were not rated because they have just started.

Overall, the lab's work for FE is rated between excellent and outstanding. We are particularly pleased at the lab's execution of FE's SECA program (the Solid State Energy Conversion Alliance) for solid oxide fuel cells. We look forward to continuing our work with PNNL in FY 03.

Marvin Singer  
Office of Fossil Energy

<<aal51010.doc>> <<APCI's-PNNL\_ST EvalForm 02.doc>>  
<<Evaluation-PNNL-FWP#44468.doc>> <<FWP42723\_MCgrail.doc>>  
<<FWP42724\_He.doc>> <<PNNL EvalForm 02.doc>> <<PNNL2evalWilson.doc>>  
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EvalForm 02\_1.doc>>